

POME FRUIT ORCHARDING IN TASMANIA

Its Evolution And Present
Geographic Basis

by

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submitted in fulfilment of the requirements
for the Degree of

Master of Arts

University of Tasmania

Hobart

May, 1961.

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INTRODUCTION

THE STATUS OF THE TASMANIAN POME FRUIT INDUSTRY

The pome fruits are both the foremost crop and the most highly specialised form of agricultural activity in Tasmania - on almost all the holdings growing fruit commercially, apples and pears are the principal source of income. Commercial production is confined to a small number of well defined localities within seven major producing regions (Fig. 1), for orcharding is an industry which benefits from concentration due to the need for many specialised facilities, namely packing sheds, cool stores, processing factories, case mills, transport services, marketing and shipping agencies. This localisation is even more striking in terms of area, for from 16,400 acres of apples and 1,400 acres of pears, a mere 5% of the total crop land, are produced annually fruit worth up to £8,000,000, some 35% of Tasmanian agricultural production. Apple production is dominated by the southern group of producers, the Huon Valley, D'Entrecasteaux Channel, lower and mid Derwent Valley, Tasman Peninsula and Triabunna (Fig. 1), which have no less than 82.5% of the bearing trees. The Huon Valley - the name is synonymous with apple growing in Tasmania - easily leads with 63% of the bearing trees. The northern regions in the Tamar and Mersey Valleys account for the remaining 17.5% of apple trees. Pear production is somewhat more evenly distributed with 31% of the trees in the north and 69% in the south but with no one region outstanding.

Mean climatic conditions are favourable to fruit growing in northern and southern regions alike with a long warm growing season (more than 200 frost free days), a low incidence of damaging spring frosts, high sunshine totals

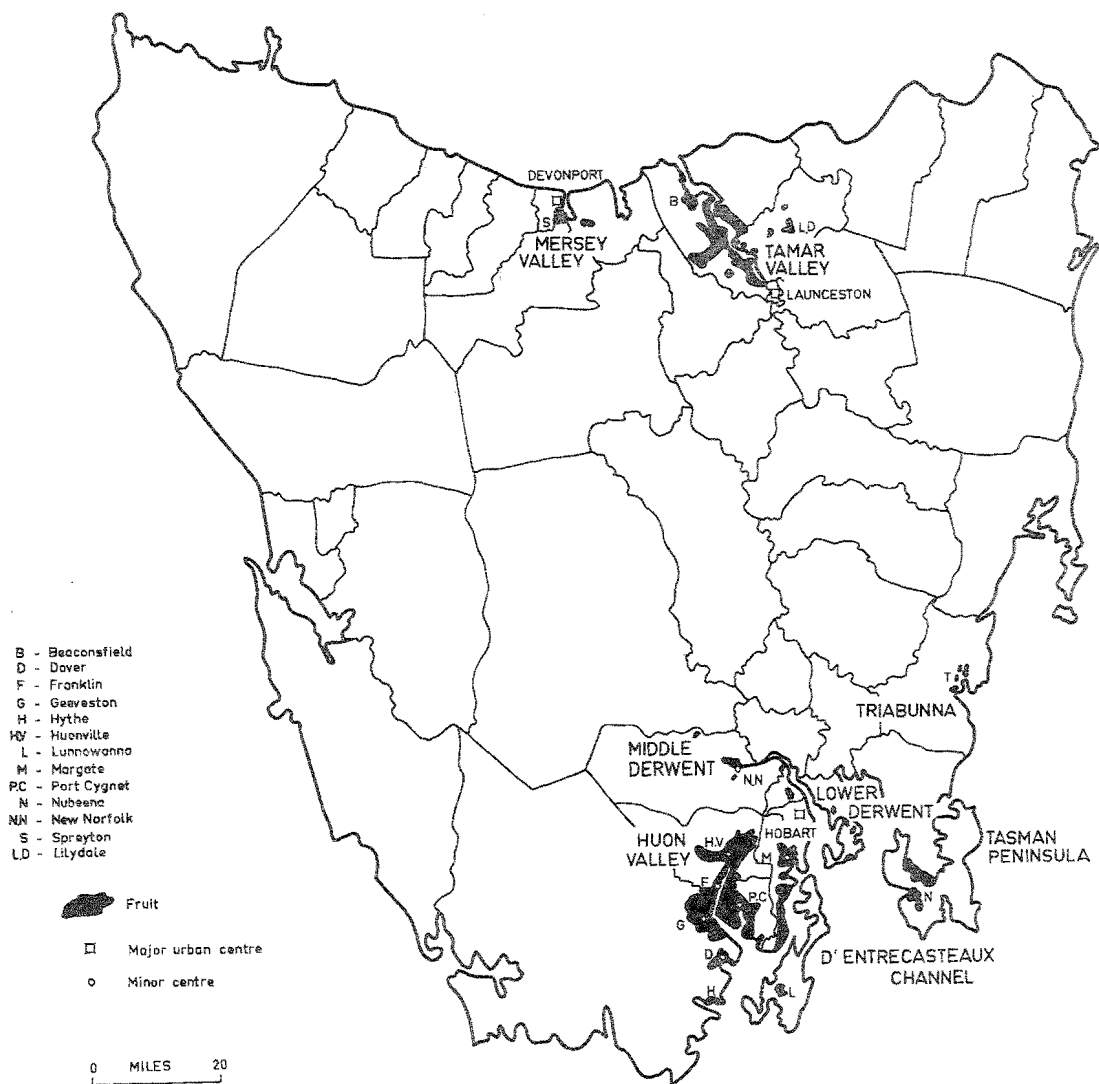


Fig. 1. The Major Pome Fruit Orchard Regions.

(over 2,000 hours) and a moderate and well distributed rainfall (25 - 40 inches). Characteristically orchards occupy sites on the gentle lower slopes of the coastal and valley lands (Fig. 1) where there are deep, well drained soils and abundant shelter. The narrow coastal strip is consequently a zone of intensive land use and has a dense settlement network. This distinctive pattern varies somewhat in the north where orchards are located in a number of scattered blocks and also at Triabunna where a large pome fruit plantation is operated by a fruit processing and shipping company.

The orchard farms are small, compact and owner operated with very high yields per acre and a high degree of mechanisation. The apple is the leading fruit, more especially in the south, but pears are grown on most holdings as a subsidiary crop and become a more significant part of production on the West Tamar and in the orchards of the south-east. Rarely are other orchard fruits grown in conjunction with the pome fruits, the only notable exception being stone fruits in the Derwent Valley. The pattern of production is not altogether uniform for in a number of features the northern orchards differ from those of the south, being larger, having smaller trees more widely spaced, less intensively cultivated and producing lower yields per tree and per acre.

The orchard landscape is not only distinctive - in the blossoming period it is an attraction for many thousands of sightseers - but also displays a considerable degree of homogeneity throughout the various regions. The small, regular sized apple trees carefully pruned into an open centre shape and the larger vase shaped pear trees, are densely planted in orderly rows in small rectangular blocks, sheltered by patches of native eucalypts or planted windbreaks of exotics. The clean cultivated and tidy orchards, small neat farmsteads, the close knit settlement and road network,

form a pattern of human activity which is unmatched in Tasmania for its intensity.

Total production over the last decade has averaged some 5,000,000 bushels of apples and 400,000 bushels of pears. This places Tasmania as the leading apple producing state in the Commonwealth (in 1959 Tasmania grew 45% of the Australian apple crop) and second only to Victoria for pear production (in 1959, 9.5% of the Australian crop). The bulk of the pome fruit crop is exported, for Tasmania with but a small home market must necessarily look to overseas outlets for the disposal of her fruit. Some 60 - 70% of the apples are shipped overseas - principally to the United Kingdom - in 1959 this was 75% of Australia's overseas apple shipments. Much of the remainder goes to the mainland or is processed in local canning and evaporating factories. An even greater proportion of the pears, 70 - 80%, are exported and this amounted to 29% of Australian pear shipments in 1959.

The present trend within the industry is one of contraction, particularly in the case of small outlying centres of production in areas of unsuitable climatic conditions. Costs of production, presentation and shipping are constantly rising with no corresponding increase in selling prices. These factors together with growing market competition have resulted in a substantial loss of inefficient, low yielding and marginal orchard holdings. The total acreage is declining, the number of orchardists falling and the average size of holdings is increasing, while cultural efficiency and correspondingly yields have risen and pome fruit production is becoming increasingly specialised.

Such, in brief, is the status of Tasmanian pome fruit orcharding today. This is, however, but a stage in a century

and half of development. Consequently the purpose of this study is to evaluate both the present geographic basis and the evolution of pome fruit orcharding in Tasmania. For only by an understanding of the past development is it possible to explain many of the present characteristics of location, production, regional differences, changing markets and the pattern of settlement in the orchard regions. With this aim in view the study has been divided into two major sections, one dealing with the evolution the other with the present orcharding pattern.

SECTION A.

THE EVOLUTION

The evolution of pome fruit orcharding in Tasmania has passed through several distinct phases of development which have been inextricably bound up in the general economic and social development of the island. The initial stage in this sequence was that of exploration and the later exploitation of the natural resources, especially timber, in the potential orcharding regions. This paved the way for the second phase that of permanent settlement effected from two primary points of expansion - Hobart and Launceston. From these centres pioneer settlement pushed outwards, inland along the river valleys and following the coastline. The first orchards were in the clearings and gardens of these pioneer settlers. The sole purpose of this form of fruit growing was to serve the immediate needs of the pioneer family.

The pioneer subsistence stage was normally brief, for once established the pioneer farmer concentrated on those crops most suited to the environment and which afforded satisfactory returns. Fruit growing on a semi-commercial basis as part of a mixed farm economy was to be found in all the cultivated areas of Tasmania in the mid nineteenth century. In addition large amounts of fruit were produced in small urban and suburban fruit gardens, worked on a part-time basis, in the environs of Hobart and Launceston. The fruit grown in this way was intended mainly for home or local consumption with any surplus that was available being sold in the urban centres or to a rapidly expanding colonial market.

From this general distribution of farm orchards and fruit gardens there developed late in the nineteenth century, highly specialised commercial orchard holdings. The commercial development that took place in the period from 1870 to 1890 arose initially out of the rapidly growing demand

for Tasmanian apples and pears on the inter-colonial markets. The introduction of refrigeration in 1885 and the consequent shipments of fruit to the United Kingdom, brought an even greater demand. However, the new overseas markets were highly discriminating, wanting only top grade fruit such as could be produced under commercial conditions. The transition from the uncared for farm orchard to the specialised commercial orchard holding was significantly hastened by the increasing damage caused by orchard pests and diseases. Pest control was only within the compass of the full time commercial grower. Commercial orchards were first established in the south in the Huon and Derwent Valleys but the continued expansion of the United Kingdom market and the introduction of free inter-state trade in 1901, produced a general boom in commercial plantings. On the Tamar and Mersey, orchards were planted in a speculative manner, many to be later abandoned or destroyed due to poor choice of site or inefficient management.

The present stage of development is one of rationalisation and diversification. There has been drastic adjustment to physical and economic conditions. Orchards planted in areas of low rainfall or on unsuitable sites or low yielding because of poor management, have been removed in the face of rising costs of production and uncertain market prospects.

This sequence of orchard development is one which is typical of many areas of recent European settlement in temperate latitudes. There is a close similarity between the pattern of evolution of the Tasmanian pome fruit industry and those of the Pacific coastlands of North America, New Zealand and South Africa.

Orchard fruits were among the first crops introduced into Tasmania. In 1820, only seventeen years after the arrival of the first settlers, it was recorded that, "All

those fruits which are commonly produced in the mother country are regularly grown in this island."¹ Even as early as 1823 it was evident that fruit was being extensively grown² with the apple and peach as the most plentiful.³ As cultivation extended from the initial settlements at Hobart and Launceston orchards and fruit gardens were planted in many parts of the island in the 1820's and 1830's. In the south, orchards were recorded at Richmond in 1823,⁴ Pittwater 1826,⁵ Clarence Plains 1829,⁶ Bagdad and Bridgewater in 1833.⁷ Around Launceston orchards were planted in the valley of the South Esk, at George Town on the Tamar and in 1829 plantings had been in the north-west at Port Sorell and on the Mersey. Orchards were established in the Huon Valley in the late 1830's and early 1840's, immediately after the beginning of settlement, at Garden Island Creek in 1838, Grove and Victoria in 1840 and at Franklin in 1842.⁸

The first orchards and fruit gardens were established from seedling trees or pips brought by the settlers from Britain. The apple appears to have been the most popular fruit and its rapid growth and heavy yields impressed local residents and visitors alike. For instance, after a visit to Tasmania in 1832 Bischoff recorded that, "Apple orchards have been formed to a great extent; much of the fruit is of very good quality and grows to an immense size."⁹ The climate was already recognised as one particularly favourable for apple

1 Jeffreys, C., 'Van Diemen's Land', London, 1820, p. 153.

2 "The Hobart Town Gazette", 13th December, 1823.

3 "The Tasmanian Almanack", Hobart, 1824, p. 24.

4 "The Hobart Town Gazette", 13th December, 1823.

5 "The Hobart Town Gazette", 5th August, 1826.

6 "The Colonial Times", 3rd July, 1829.

7 "The Colonial Times", 19th April, 1833.

8 "The Huon and Derwent Times", 17th August, 1939.

9 Bischoff, J., 'A Sketch of the History of Van Diemen's Land', London, 1832, p. 66.

trees¹⁰ which thrive in the pest free environment and were "astonishingly prolific."¹¹ Such was its popularity that by 1827 it could be reported that "there is scarcely an apple known in England which has not been introduced into some parts of the colony."¹² The present orchard specialisation has been a direct evolutionary development out of the ubiquitous 'kitchen' and 'farm' orchards of this early period.

I. FRUIT GROWING UNDER PIONEER FARMING CONDITIONS.

The 'kitchen garden' or 'house orchard' was the typical form of fruit growing practiced in the early and mid-nineteenth century on the frontiers of settlement and gradually spread over the island with the expanding pioneer fringe. Initially subsistence farming was a necessity enforced by the colony's extreme isolation when in the early years the constant fear of food shortages dominated the settlers' activities. But once the fertile valley lands along the Derwent and South Esk were being utilised, farming on a near subsistence level was confined to the more isolated fringes of settlement, while a more mature, mixed and semi-commercial farm economy developed in the earlier settled areas.

Pioneer farming incorporating fruit growing is best exemplified by the areas to the south of Hobart¹³ in the period 1836 to 1860. The Huon Valley and D'Entrecasteaux Channel are regions which have experienced the full sequence of development of fruit growing and since they were also destined to become the leading producers, most merit a

10 "The Hobart Town Courier", 21st March, 1929.

11 "The Tasmanian Almanack", op. cit., p. 24.

12 "The Colonial Times", 19th January, 1927.

13 Typical in general of the forested parts of the island, in the Midlands land was granted or leased as enormous grazing properties.

detailed examination. These southern areas were densely wooded with eucalypt forest and had been explored and in part cut over by timber getters and sawyers. The partially cleared land exposed the potentialities of the soils and facilitated clearing for settlement and agriculture. The first sale of crown land in the Huon Valley was recorded in 1836 when blocks were purchased at Franklin and Woodstock. These purchases evidently attracted little attention for in 1839 there were only seven permanent residents.¹⁴ Impetus was given to permanent settlement in 1839 by the then Governor's wife, Lady Jane Franklin, who purchased a block of 640 acres at Franklin. She had the land sub-divided and let to tenants, personally taking an interest in what was significantly named "the settlement". The settlement of Franklin not only attracted new settlers but also became the staging point for the establishment of new settlements both up and down the Huon estuary. For instance, both the Huonville and Geeveston districts were pioneered by families who settled first at this initial centre. Another form of government encouragement to settlement was given by the establishment of convict probation stations in the southern districts early in the 1840's, at Lymington, Dover, Southport and Oyster Cove. These were primarily intended to clear and cultivate the land.¹⁵

The interest shown by the colonial government undoubtedly drew the attention of would be settlers to the Huon Valley, and by the mid 1840's land grants were numerous.

14 Moore-Robinson, J., 'Tasmanian Nomenclature', Hobart, 1911, p. 28.

15 Despatches from the Lieutenant Governor's Office to the Colonial Office, Vol. 52, 1st July to 25th September, 1845.

At first these grants were of large isolated blocks of 500 - 600 acres, usually oblong in shape and extending from the river frontage back into the hills.¹⁶ Choice of land was largely determined by soil potential, level terrain and proximity to a water supply. But the paramount need was ease of access to navigable water, due to the rugged relief of the hinterland, the dense forest cover and the complete lack of overland routes.

The granting of large blocks soon ceased when it was realised that large amounts of forest land could not be handled by one operator. Extensive grazing was out of the question since only by long and arduous clearing could land be won from the forest. Consequently many blocks were subdivided into smaller units manageable by one family. This established the present day pattern of small land holdings and which has been an important factor behind the later development of commercial orcharding on small, intensively cultivated farm units.

The pioneer families were forced by isolation, the uncertainty and high prices of supplies, to strive for a high degree of self-sufficiency. Equally important was the social background of the settlers. The majority were of labouring stock with little farming knowledge and many were ex-convicts or 'ticket of leave' men. Their only capital after purchasing land was their own labour and that of their families. The primary aim was to eke out a living until they were firmly established and sufficient land was cleared to be able to turn their attention to commercial cropping.

16 Report by W. Alcock Tully on the North Huon, House of Assembly Journals, Vol. 5, No. 100, 1860.

In the case of the few more substantial settlers with capital to pay for labour - usually assigned convicts - to clear and break in the land, the pioneer stage was less evident, though isolation affected all.

The initial clearing of the woodland followed a uniform pattern, the only variable factors being the density of the natural vegetation¹⁷ and the amount of capital and labour at the disposal of the settler. The first year of occupation would be spent in 'scrubbing', that is the felling of the light timber - young trees not more than one foot in diameter - and clearing the undergrowth with axe and billhooks. The larger trees were 'ring barked' and left to decay. This process was followed by the 'logging up'; teams of bullocks or even hand labour were used to haul the logs and branches into piles where they were fired in the late autumn. In the second year the burning off continued, small stumps and roots were grubbed out by mattock and small debris was picked up by hand. Efforts were made to cultivate the land as early as possible, the ground being broken in by hand cultivation with a hoe. Seldom was complete clearing achieved at once and patches of cultivated land remained littered with decaying stumps, logs and standing ring barked trees for many years, despite repeated firings.

17 In northern Tasmania the costs of clearing were estimated at an average of £4 an acre in 1860, while in southern Tasmania costs were treble this figure, emphasising the greater density of forest cover and the increased difficulties facing the pioneer settler in the south.
Report by W. Alcock Tully, op. cit.

A cleared block of 10 to 15 acres was considered to be a sufficient unit to support the pioneer family, although in the first instance only a few acres would be cleared. In this initial clearing the first primitive homestead would be built, probably of two rooms constructed perhaps of, "a few slabs for walls, roofed with sheets of bark, which are kept in their place by logs and stones and a chimney whose top consists of an old cask and even the lower part often made of palings with a dabbing of mud inside."¹⁸ Around the house would be planted a few fruit trees, small fruits, potatoes, wheat and vegetables - the principal items of diet. For "the land was first cultivated for foodstuffs for the local population and at this stage local needs at a subsistence level determined the intensity of tillage."¹⁹

The pioneer farmer was forced by the difficulties and isolation of his environment and by his own socio-economic conditions to practice an almost self-sufficient economy in the early years of settlement. The dense woodland could only be cleared by slow and painful labour and no immediate agricultural returns were possible as with natural grazing land. Even were the growth of cash crops possible, the relative isolation of the southern districts and the colony as a whole, handicapped the early introduction of a commercial economy.

A typical case is the pioneering of the Geeveston district in the Huon Valley. This was a densely forested area covered with stringy bark, swamp gum and blackwood and

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- 18 From a description of a pioneer homestead in the Huon Valley, Walch's Tasmanian Guide Book, Hobart, 1871, p. 71.
- 19 Hartwell, R.M., 'The Economic Development of Van Diemen's Land', 1820-1850, Melbourne, 1954, p. 6.

which had been first visited by timber splitters in the late 1830's. In 1848, 80 acres of alluvial river land on the Kermandie River was alienated to the Geeves family. They had settled first at Franklin after arriving in Tasmania as assisted migrants in 1843. No less than 30 persons made the move, all of the one family plus assigned convict servants. Clearing began in January 1850 and by mid-year 12 acres of potatoes were planted between the stumps and logs. Slab huts were built and the land was worked in the day while at night shingles and laths were split to sell at infrequent intervals in Hobart to pay for essential foodstuffs such as flour, sugar, salt, corned beef and for clothing. The first apple trees were planted in 1851 using stocks brought out from England. Some twenty-two trees were planted in all, in rows 24 feet apart, the main varieties being Ribstone Pippin, Winsap, Scarlet Pearmain, Blenheim Orange, French Crab, Alexander and Stone Pippin. Unpruned and uncultivated these seedlings were allowed to grow to a large size as in England.²⁰ From such humble beginnings has developed the highly specialised and intensive form of agriculture today.

Fruit growing began therefore as part of a near subsistence economy. Apple trees were planted by the pioneer, "to supply themselves with fruit more than with the intention of marketing the produce for sale."²¹ Little regard was paid to physical factors in planting fruit trees other than the soil being suitable for general agriculture. The traditional British system of planting an orchard around the homestead was continued, hence the name 'kitchen garden' or 'house orchard.'

20 The Centenary of the Huon Valley, "The Huon and Derwent Times", 17th December, 1936, p. 7.

21 "The Tasmanian Fruit Grower," 14th August, 1915.

The method of planting was influenced by the environment and trees of all types and varieties, for instance, apples, pears, plums, cherries, peaches and apricots were planted in an haphazard manner, scattered over a partially cleared plot. In some cases as a stump was pulled out a fruit tree was put in. Orchard cultivation, pruning, manuring and pest control were unknown and in what proved to be a very favourable environment with virgin soils, the trees grew vigorously and yielded heavily. The fact that fruit trees required little attention after being planted and would in later years provide a surplus for sale, made fruit growing a favourite pioneer crop.

The mood of the period is well summed up by Hartwell, "The pioneer settlers were attempting to establish a society and way of life such as they had known in the mother country, their methods were those of the homeland, although enforced by the environment to a more primitive level in the early years"²²

II. ORCHARDING ON A SEMI-COMMERCIAL BASIS.

1. Orcharding Practices.

From the 1820's the frontiers of pioneer settlement expanded rapidly from the two primary settlements of Hobart and Launceston. Around these two growing urban centres a more mature and commercial type of agriculture developed. The first true form of commercial farming was sheep rearing on the natural grasslands of the Midlands. This development was significant in the general change of mood which took place in the colony once it was realised wool could be exported. The fear of recurring food shortages was removed once and for all and the way was open for production on a commercial or semi-commercial footing in other agricultural pursuits.

22 Hartwell, R.M., op. cit., p. 6.

Orcharding on a semi-commercial basis developed under several types of agricultural economy. Firstly there was the widespread distribution of 'farm' orchards on mixed farms in the areas of older settlement in the Derwent, Tamar and South Esk Valleys. In the Midlands and along the east coast, orchards were planted around the large pastoral properties, for instance at Oatlands, Tunbridge, Ross, Campbell Town, Hamilton, Fingal and Swansea. On the scattered and isolated small holdings of the southern settlers, orcharding was combined with small scale farming producing potatoes, wheat, roots and small fruits, worked in conjunction with cutting timber. The most localised and intensive form of orchard production was to be found in the small fruit gardens, worked on a part-time basis in and around Hobart and Launceston.

Orchard culture and management in this period remained very much on laissez-faire lines. Production was primarily for home and local use²³ though an ever increasing surplus was exported to the mainland colonies. Fruit trees were normally planted in a compact block by the side of the farm or home-stand. The orchard was usually small - from a few trees to a few acres in size - with the trees widely planted out on more or less systematic lines. Fruit of all types, apples, pears, plums, cherries, peaches and apricots were grown in the one

23 Cider making was popular in the 1830's and 1840's, particularly on the east coast. In 1849 out of a total of 16 manufacturers, 8 were at Swanport (Swansea) and Spring Bay. The others were at Campbell Town, 4, Launceston 3, and Richmond 1. As fresh fruit exports increased, cider production fell. For instance in 1871, Walch said of Swansea, "Cider was formerly extensively made but since the export of apples has proved to be profitable the manufacture has been unfortunately neglected." Walch's Tasmanian Guide Book, Hobart, op. cit., p. 134.

orchard with a wide range of varieties. There were for example, some 120 varieties of apples and 60 varieties of pears produced in Tasmania in 1860, grown from seedling stocks or pips brought from the United Kingdom, North America, France, Germany and Italy.²⁴ Evidently growers did not discriminate greatly as to variety or quality of seedling stock, "The desire to have fruit trees of any kind in the early period of the colony has filled many of our gardens with fruit, particularly apples and peaches of a very inferior quality."²⁵ Orchard maintenance was a sideline operation which received attention only when the major activities of the farm were already attended to. As one farmer in the Cressy district expressed it, "The fruit is grown for domestic purposes and people do not generally value it . . . the work of attention comes just when the farmer is busy harvesting."²⁶ Many if not most of the orchards had livestock grazing in them. Uncultivated and unpruned the trees grew to a large size, bearing irregularly and producing fruit which was seldom of high or uniform quality.

By 1860 - the first year of detailed statistics - pome fruit production was clearly concentrated in the urban and suburban fruit gardens of Hobart and Launceston. (Fig. 2). Together these two centres produced more than half the apple crop and the bulk of the pears. Launceston was the leading district in 1860 producing 45,000 bushels of apples, some 43% of the total crop and 5,000 bushels or 17% of the pears. (Pear production in 1859 had been 20,000 bushels, 60% of the total crop). Launceston together with the prosperous general

24 Whiting, G., "The Products and Resources of Tasmania", Hobart, 1862, p. 35.

25 "The Tasmanian Almanack", Hobart, 1834, p. 234.

26 Report to the Tasmanian Parliament on "Orchard Insect Pests and Blight", 1890, No. 94.

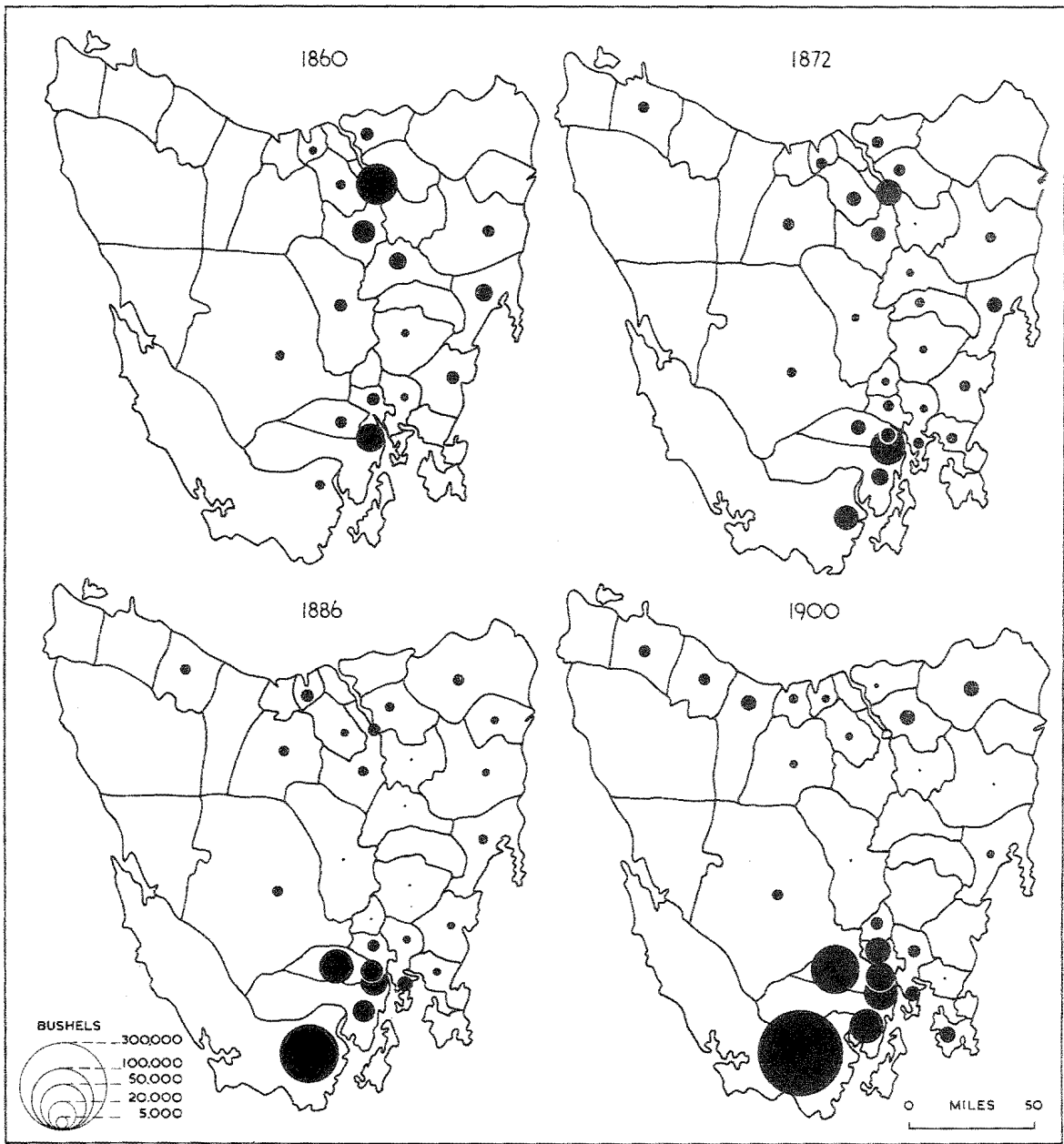


Fig. 2. Distribution of Apple and Pear Production, 1860, 1872, 1886 and 1900 (by municipalities and police districts).

farming districts of the north - Longford, Cressy and Westbury, had the largest concentration of orchards. In 1860 they accounted for 63,000 bushels out of the state's 106,000 bushel apple crop. Hobart and the mixed farming districts around, New Norfolk, Brighton, Richmond and South Arm, followed with 24,000 bushels. The east coast achieved third position with almost 10,000 bushels and much of the remainder was accounted for by a number of centres in the Midlands, such as Bothwell, Campbell Town, Hamilton and Oatlands. The southern districts were as yet minor producers, in 1860 the Huon Valley had an apple crop of a mere 3,000 bushels. (Fig. 2). However, nowhere does orcharding appear to have been the leading crop, for instance at Swansea on the east coast, apples were listed after wool and wheat as the principal products,²⁷ while in the Huon Valley fruit growing was subordinate to timber and general agricultural crops.²⁸

Total production of apples and pears fluctuated from year to year but there does seem to have been a general increase in the 1830's, 40's and 50's corresponding to the general expansion of agriculture and settlement in Tasmania. During the 1860's and 1870's production stabilised, averaging some 120,000 to 150,000 bushels of apples and 15,000 to 30,000 bushels of pears. There were, however, major changes in the regional pattern of production in this period. In the southern and south-eastern districts production rose sharply (Fig.2) for instance in 1870 these areas yielded 90,000 bushels of apples out of a total crop of 147,000 bushels. (Hobart and district 46,000 bushels, the Huon Valley 25,000 bushels and the Derwent Valley 10,000 bushels). Conversely the northern and midland areas declined heavily, Launceston in particular

27 Walch's Tasmanian Guide Book, Hobart 1876, p. 134.

28 Petition for a road to the Huon, Journals and Printed Papers of the House of Assembly, 1857/58, No. 51.

(Fig. 2) and it was evident that major changes in location of fruit production were taking place.

The cause of this shift of emphasis appears to have been primarily due to the increased incidence of orchard pests, in particular the codlin moth. Little was known about orchard pests by fruit growers and nothing was done to keep them in check. From the time of the codlin moth's first appearance in the north in the 1850's, fruit production on the casually maintained farm orchard or fruit garden was doomed to virtual extinction. In the period from 1860 to 1890, the ravages of the codlin moth caused the reorientation of fruit production in Tasmania from the northern to the southern areas and materially hastened the development of commercial orcharding. It is very significant that the non-infested Huon Valley became the leading commercial producer, while the heavily infested urban fruit gardens of Hobart and Launceston, in 1860 the major producers, lapsed into relative obscurity.

2. The Codlin Moth.

The codlin moth seems to have first appeared in orchards at Invermay and St. Leonards near Launceston in 1855.²⁹ The pest spread rapidly throughout the Launceston district and as little was known of its habits and almost nothing was done to keep it in check, losses were very heavy. Production of apples and pears in Launceston - the leading producer - dropped from 45,000 bushels of apples and 5,000 bushels of pears in 1860 to 4,000 and 1,800 bushels respectively in 1864. The northern orchards were never able to recover from the depredations of this pest and throughout the 1870's and 1880's reports of heavy losses were almost yearly

29 Osbourne, J., 'Fruit Culture in Tasmania', The Agricultural Gazette of Tasmania, February, 1911, p. 66.

occurrences.³⁰ For instance in 1871 it was reported by the Launceston collector of agricultural statistics that, "in apples there is a great decrease owing to the ravages of the grub, which has destroyed thousands of bushels."³¹ Similarly in 1880, "The codlin moth has been very destructive this year; thousands of bushels of fruit being destroyed in orchards around Launceston."³² By the 1870's Launceston had declined to the position of a minor producer (Fig. 2). A contemporary writing in 1876 paints a gloomy picture, "For some years past the apple orchards in the northern part of this colony have almost ceased to be productive."³³ Many orchards had to be abandoned or destroyed and the northern fruit industry faced complete extinction.

In 1875 codlin moth grubs were reported for the first time in the apple orchards of Hobart, having probably been introduced in a case of plums sent from the north.³⁴ The insect spread swiftly through the closely planted urban fruit gardens and by 1886 Hobart and the surrounding orchard districts in the Derwent and south-east were heavily infested. (Table 2 and Fig. 2). The apple growing industry of Hobart worth £40,000 annually in exports, seemed threatened with extinction. Losses grew progressively worse with the majority of orchardists taking little or no action.³⁵ In 1888 the damage evident-

30 In 1871, '74, '75, '76, '78, '79, '80, '81, etc., though total losses fluctuated with climatic conditions, the moth thriving best in warm, dry summers.

31 Statistics of the colony of Tasmania, 1871, p. 193.

32 Ibid. 1880, p. 217.

33 Dobson, Mr. Justice, 'The Codlin Moth', Papers and Proceedings of the Royal Society of Tasmania, 1876, p. 26.

34 'The Codlin Moth', Report of Select Committee to the House of Assembly, No. 141, 1878, p. 10.

35 The chief known remedies were; bandaging of the tree trunks, the removal and destruction of infested fruit and by clearing the orchard of weeds and debris where the pest could shelter.

ly reached a climax, "The dry season has been favourable to the working of the moth, which will account for the almost total destruction of the apple crop this season in the Hobart district."³⁶ In that year the total production of apples was only 10,000 bushels (much of this may have been infested fruit which could be sold cheaply in the city) compared with the record crop of 53,000 bushels in 1863.³⁷

Table 1 Examples of Individual Losses from Codlin Moth in Hobart, 1886, 1887 and 1888 (production in bushels).

Orchard	1886	1887	1888
A	100	50	5
B	250	100	-
C	400	35	-
D	200	72	-
E	100	50	-

Table 2 Areas Infested by Codlin Moth, 1888.

District	Acreages		
	Non Infested	Infested	Total
West Devon	228	37	265
Launceston	285	1445	1730
Ringarooma	180	14	194
Midlands	200	280	480
Upper Derwent	652	293	945
Glenorchy	218	1043	1140
North-West Bay	149	21	170
Gordon	259	-	259
Port Cygnet	700	-	700
North Huon	802	4	806
Central and South Huon	1140	-	1140

Source. Report of Inspector for the Codlin Moth Act, loc. cit.

36 Report of Inspector for the Codlin Moth Act, Journals and Printed Papers of the House of Assembly, No. 80, 1888, p. 6.

37 The average crop was 30,000 to 40,000 bushels until 1878 when damage from codlin moth first became severe.

The increasing depredations of the codlin moth caused state wide concern. Parliamentary interest was aroused and a Select Committee was appointed to report on the matter in 1879. The findings of this Committee and the ever increasing losses prompted the Government to take legislative action in 1884 with the passing of the Codlin Moth Act. The act set up a system of orchard inspection with penalties for those who failed to take action against the pest. Regional fruit boards were also to be established voluntarily to assist with administration. Although the act in itself was not an outstanding success - many fruitgrowers actually opposed it - it did illustrate the importance attached to the expanding fruit industry. Equally significant is that this was the first instance of government guidance through inspection and implemented the first steps in the gradual raising of standards of production and marketing which have become a feature of modern commercial orcharding.

The Codlin Moth Act showed the casual and semi-commercial farm orchard to be not only unprofitable in the face of serious losses from pests, but to be a positive threat to the new commercial plantings. The casual grower neglected his orchard once it was infested - indeed pest control on the tall overgrown trees was almost impossible - allowing the moth to breed unimpeded and so largely contributing to its spread. The marketing system was similarly haphazard, for the common practice of selling infested fruit throughout Hobart in the 1880's must have considerably aided the extension of the pest in the southern districts.³⁸

³⁸ Tasmania is also credited with having introduced the pest to New Zealand in an apple shipment to Auckland.

The influence of the codlin moth on the orcharding pattern was both widespread and lasting. By the 1890's the urban and suburban fruit gardens had declined both relatively and absolutely to positions of negligible importance. For example, in 1892 the state apple crop was 604,255 bushels of which Launceston contributed 3,200 bushels and Hobart 14,000 bushels. The already expanding commercial orchards of the Huon Valley, D'Entrecasteaux Channel and Tasman Peninsula, which remained non-infested areas, had a decided physical advantage. The final outcome was the complete reorientation of the fruit growing industry both regionally and economically. The centre of gravity moved to the south of the island with decline of the northern orchards and to the far south when the moth reached Hobart. (Fig. 2). In addition the codlin moth speeded up the transition from the neglected, semi-commercial orchard to new plantings on a commercial basis where improved standards of cultivation, management and pest control were feasible.

3. The Pattern of Trade, 1820 - 1880.

i) The development of a local market.

The first markets for the pome fruits were the pioneer families who settled in and around Hobart and Launceston and who had planted fruit trees in 'kitchen' gardens or 'house' orchards. These plantings were prompted by the fear of food shortages and by the desire of the pioneer settlers to provide themselves with a supply of fresh fruit. The pome fruits flourished and by the 1830's crop surpluses were occurring in favourable seasons, as for instance in 1830 when, "the crop was so enormous this year as to be literally thrown away."³⁹ The pioneer farmers were turning more and more to

39 Betts, T., "An Account of the Colony of Van Diemen's Land", Calcutta, 1830, p. 92.

commercial cropping and fruit growing would provide at least a supplementary source of income from the surpluses which could be sold after a good crop. This trend was stimulated by the rapid increase in the population of the colony after 1820, rising from 5,468 in that year to 24,279 in 1830. The greatest increase was in the two primary settlements of Hobart and Launceston and together they accounted for approximately 50% of the total population. They were large enough to provide an urban market for the agricultural produce of the surrounding areas and the sale of fruit was part of this local trade. In 1828, for example, it was reported that apples were selling in Hobart Town for 10/- per case.⁴⁰ The primitive land transport of the time must have strictly limited the area from which the supplies of fresh fruit could be drawn to within a radius of a few miles of Hobart and Launceston. Only where easy access to sea or river transport was possible, as along the Derwent and Tamar, was the agricultural hinterland extended beyond the immediate periphery of the two main centres. Elsewhere orchards provided for only home and immediate local consumption.

ii) The growth of the colonial trade.

By the early 1830's supplies of fresh fruit were regularly outstripping the demand of the still limited local urban markets. Small shipments of green fruits - apples and pears - were consequently attempted to the neighbouring colony of New South Wales. In 1830, 15 casks of apples⁴¹ were recorded leaving Hobart for Sydney and this may have been the first fruit shipment to that colony. A further shipment made to Sydney in 1833 of, "19 casks of excellent apples carefully packed from the orchard of Mr. John Espie at Bagdad - a spec-

40 "The Hobart Town Courier", 18th February, 1828.

41 "The Colonial Times", 23rd April, 1830.

ulation which we trust will turn out well,"⁴² suggests that fruit was still not a usual item of trade.

In the 1830's and 1840's fresh fruit became part of a considerable trade in foodstuffs with the mainland colonies and, "during the 1840's, livestock, wheat and flour, hay and fruit found a good market on the southern shores of Australia"⁴³ Trade in fruit gradually expanded and prospered throughout this period with prices being particularly high in times of food shortages in New South Wales. In July 1848 for instance, Van Diemen's Land apples were selling in Sydney at from £1. 5. Od. to £1. 10. Od. a case.⁴⁴ New markets became available with the founding of colonies in South Australia, Victoria and West Australia. Trade links were evidently firmly established by 1840 when New South Wales received 550 packages of Tasmanian fruit, Victoria 448, South Australia 103 and West Australia 13.⁴⁵ The trade with Victoria especially flourished and Launceston, geographically better placed to serve the Victorian market, outstripped Hobart in total exports of green fruits in the late 1840's. Shipments to Victoria were also more frequent than to other markets and a trade was established with a number of southern Victorian ports such as Port Phillip, Geelong, Port Albert and Port Fairy.

Table 3. Exports of Green Fruits from Hobart and Launceston, 1846, '47 and '48. (In packages).

	Hobart	Launceston	Total
1846	1997	2745	4742
1847	1618	3610	5228
1848	1820	3243	5063

Source. Tasmanian Royal Kalendar, 1849.

42 "The Hobart Town Courier", 12th April, 1833.

43 Bonwick, J., 'The Early Struggles of Trade in Australia', London, 1888, cited "The Mercury", 7th March, 1929.

44 "The Hobart Town Courier", 8th July, 1848.

45 "The Hobart Town Advertiser", January - December, 1840.

Towards the end of the 1840's exports were increasing steadily each year and the prospects of markets further afield were being explored. In 1849 the colonies in New Zealand were receiving Tasmanian apples⁴⁶ and ships trading with the Pacific Islands were taking small and infrequent quantities of fruit.⁴⁷ The island of Mauritius had a regular trade with Tasmania and as early as 1829 apples were recorded as being included in a cargo sent from Hobart.⁴⁸ Shipments of fresh fruit were made to India in 1851⁴⁹ and a trade of fresh and dried fruits grew up with California in the years after the gold rush of 1849. Indeed in 1850 California with 24 shipments totalling 760 packages of green fruit, ranked fourth after Victoria with 1,677 packages, South Australia, 1,336 and New South Wales, 1,312, as a market outlet.⁵⁰ Even the prospects of a market in Britain were investigated and as early as 1828 apples were sent by sailing ship. But the length of the voyage and the passage through the tropics produced discouraging results.⁵¹ By the mid-nineteenth century Tasmania was recognised as the leading producer of deciduous fruits in the southern Pacific, exporting not only large quantities of green fruit, but also dried fruits, jams and preserves and seedling fruit trees.

The steady trade expansion of the 1840's was suddenly accelerated after the discovery of gold in Victoria in 1851. Trade with Victoria boomed as large numbers of prospectors flocked to the diggings. Food and materials were scarce, prices were grossly inflated - apples were sold in Melbourne

46 "The Mercury", 27th March, 1849.

47 "The Hobart Town Courier", 8th March, 1845.

48 "The Hobart Town Courier", 21st March, 1829.

49 "The Mercury", 22nd, June, 1851.

50 "The Hobart Town Advertiser and Cornwall Chronicle, January - December, 1850.

51 "The Colonial Times", 3rd July, 1829.

for as much as 17/6d. per case, whereas 6/-d. had been considered a good price in previous years.⁵² Between 1849 and 1855 the value of green fruit exports increased fivefold from £7,000 to £35,000 and reached a peak of £72,000 in 1858, (Table 4), a figure not to be surpassed until 1883.

Table 4 Value of Exports of Green Fruits, 1837 to 1860.

1837	£4,366	
1841	2,917	
1846	4,607	
1847	5,657	
1849	6,976	
1852	13,518	
1855	35,000	(pears £6,000)
1857	46,525	
1858	72,170	
1859	59,230	
1860	56,203	

Source. Blue Books (yearly statistical returns).

The northern growers, through the port of Launceston being nearest to the Victorian market, handled the largest share of this trade. In 1858 for example, Launceston shipped 72,519 cases of green fruits worth £4,680, to Hobart's 46,132 cases valued at £30,530.

The boom conditions brought about by the Victorian gold rush lasted until the early 1860's when prices fell, however, trade continued at a high level since many prospectors stayed on as permanent settlers. In 1861 - 62 a further gold rush in New Zealand brought another short lived boom. Fruit exports to New Zealand rose from 40 cases in 1860 to 10,637 in 1862 and reached 25,852 in 1864. (Fig. 3). The New Zealand trade was handled almost entirely by Hobart which in the period after 1859 gradually increased its trade at the expense of Launceston's.

52 Fenton, J., 'A History of Tasmania', Launceston, 1884, p. 252.

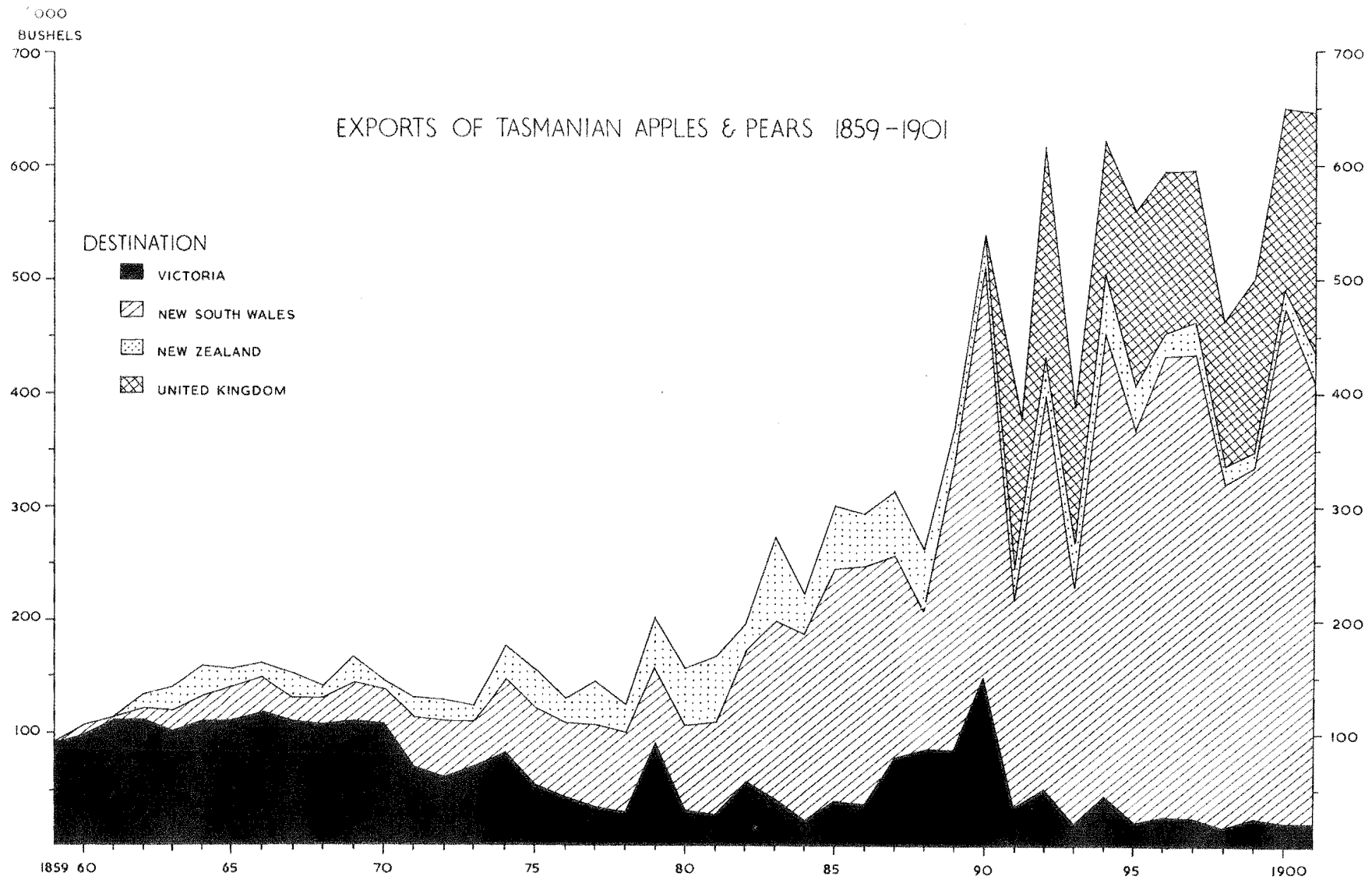


Fig. 3

The decline of the northern port and the reorientation of the export trade was brought about by a number of factors. The Victorian trade boom, which Launceston had principally relied on, was ending in the early 1860's. Production of apples and pears was also declining rapidly in the north in the 1860's and 1870's due to the bad infestation of codlin moth. There is no doubt that the superior port facilities, deep water anchorage and ease of approach and navigation possessed by Hobart were other weighty factors. This is especially significant in the light of the increasing use of large steam ships necessitating the use of a deep water port. Launceston, in spite of the advantage of proximity to the mainland, was handicapped by the difficulty of navigation along the narrow, winding Tamar and by the small depth of water available. While Hobart lying at the heart of a number of rivers and sheltered coastal waterways, could serve a much more extensive agricultural hinterland than Launceston. For example, apples at Deloraine only 25 miles from Launceston, were recorded as going to waste in 1860 through lack of transport to a market outlet.⁵³ Although Hobart had also built up a large trade with Victoria, other market outlets had been developed in New South Wales and New Zealand, when the Victorian trade declined in the 1860's it was more than offset by a rise in exports to these other markets.

Throughout the 1860's and 1870's total fruit exports remained at a constant level of from 120,000 to 150,000 bushels worth from £40,000 to £50,000 annually. However, changes were taking place in the pattern of trade with a gradual decline in the level of exports to Victoria and a corresponding

53 Petition for a railway in Northern Tasmania, Journals and Printed Papers of the House of Assembly, 1862, No. 130.

increase of shipments to New South Wales. (Fig. 3). By 1876 the latter had surpassed Victoria as the leading market outlet and New Zealand also increased her imports to assume second place in the 1880's. (Fig. 3). Small quantities of fruit were being sent to Queensland after 1860 - transhipped from Sydney - and to South Australia. Small lots of Tasmanian fruit went to Mauritius, the Dutch East Indies, the Pacific Islands of Guam, New Caledonia and Fiji and to Singapore and Hong Kong.

iii) Marketing conditions.

Under the pioneer conditions of production and marketing in the early and mid-nineteenth century, neither the growers nor the consumers of fruit were highly discriminating with regard to quality and variety of fruit sold. Both apples and pears were sold ungraded as to size, shape, colour or variety. The fruit was packed jumble fashion - often to the extent of mixing apples and pears together - being poured into rough containers made of split palings of stringy bark. A wide variety of containers were in use, such as hogsheads, boxes, casks, chests, tierces, bags, cases, barrels, baskets and packages. (Table 5). For example, in 1840 green fruit exports from Hobart were listed as; to Sydney, 34 packets, 126 baskets, 3 boxes, 1 barrel, 28 cases, 42 casks and 310 bushels, to Melbourne, 20 packets, 19 baskets, 6 boxes, 19 cases, 106 casks and 232 bushels, to Adelaide, 3 packages, 3 boxes, 3 barrels, 7 cases, 42 casks, 32 bushels and 2 tons and to West Australia, 13 barrels.⁵⁴ Shipments were made in small lots consigned by merchants or individual growers and were part of a varied general cargo. (Table 5). Under such conditions the fruit received anything but careful handling.

54 "The Hobart Town Advertiser", January to December, 1840.

Table 5 Details of Two Cargoes Shipped to the Mainland Colonies in 1848.

1. Hobart.

The "Lillian" to Port Phillip.

14,700 feet of timber.
40,000 shingles.
2,000 staves.
1,000 palings.
23 Hogsheads, 5 cases and 1 cask
 of apples.
20 bags of potatoes.
1 case of saddlery.
1 case boots.
1 bale of slops.
2 trunks of apparell.

Source. "The Hobart Town Courier", 13th May, 1848.

2. Launceston.

The "Shamrock" to Melbourne and Sydney.

1 case paper.
8 casks wine.
13 hogsheads and 12 boxes tobacco.
5 hogsheads brandy.
14 horses.
1 gig.
1 cart.
1 dray.
1 plough.
2 bags of boots.
1 bag of skins.
4 packages of iron work.
1 rubstone.
1 iron cramp.
1 cask of apparell.
38 bags of oats.
1 case of preserves.
15 casks, 1 box, 17 hogsheads, 6
 packages and 20 cases of green fruits.

Source. "The Launceston Examiner", 15th April, 1848.

Apples were shipped from Tasmania throughout the year (Table 6) with a peak in shipments in February, March, April, May and June when fruit could be sent freshly picked. Later in the year apples were exported from fruit stored in straw lined pits or stacked in sheds on the orchards. Under such rough and ready conditions it is small wonder that blemished and diseased fruit were considered to be an inevitable part of the trade. Nevertheless the trade in green fruits flourished and grew during this period and could prompt such comments as, "our trade in green fruit is developing itself year by year and shows a gradual increase."⁵⁵

Table 6 Monthly Exports of Green Fruit from Hobart and Launceston, 1858. (Cases and packages).

	Hobart		Launceston	
January	1,521	£1,131	1	£5
February	4,531	£2,723	15,117	£7,880
March	10,731	£5,556	17,615	£9,902
April	5,409	£2,884	10,533	£4,436
May	4,717	£2,715	9,077	£5,729
June	9,706	£7,460	3,486	£2,508
July	2,601	£2,325	992	£660
August	3,687	£2,835	278	£421
September	2,146	£1,635	120	£110
October	1,273	£970	-	-
November	1,557	£1,350	760	£575
December	1,554	£1,215	2	£5
Total	49,533	£32,799	57,981	£32,231

Source."The Hobart Town Gazette", Vol. XLIII, 1858.

55 "The Cornwall Chronicle", 7th April, 1866.

III THE DEVELOPMENT OF COMMERCIAL ORCHARDING

1880 - 1922.

The development of specialised commercial orcharding in Tasmania was a process of gradual transition from the general pattern of farm and house orchards, to a modified pattern of concentrations of commercial orchards in a number of well defined localities. Commercial plantings of apple trees began on a large scale in the south in the late 1870's resulting in a rapid rise in production after the mid 1880's. Apple production which had averaged 140,000 bushels since 1860, reached 200,000 bushels in 1883, and as the tempo of plantings increased, rose to 500,000 bushels in 1890, 1,000,000 bushels in 1905, almost 2,000,000 bushels in 1914 and over 3,000,000 bushels in 1922, (Figs.4&7) when the peak of 26,760 acres of bearing trees was reached.

The introduction of commercial methods to fruit growing and the resultant increase in production was a world wide phenomenon being also experienced in Nova Scotia, British Columbia, on the Pacific coast of the United States, in Cape Province and in the North and South Islands of New Zealand. Primarily this development was stimulated by the rising demand for fresh fruit in the rapidly expanding urban centres of Western Europe and Eastern North America - a market, however, that demanded high quality fruit.

In Tasmania the growth of commercial plantings was in two main phases and produced three distinct regional patterns based on physical conditions and the socio-economic conditions of the settler-planters. The earliest planting period was entirely in the south and extended from the late 1870's until the early years of the twentieth century. It was characterised by two regional patterns; the one in the Huon Valley and at a later date on the D'Entrecasteaux Channel

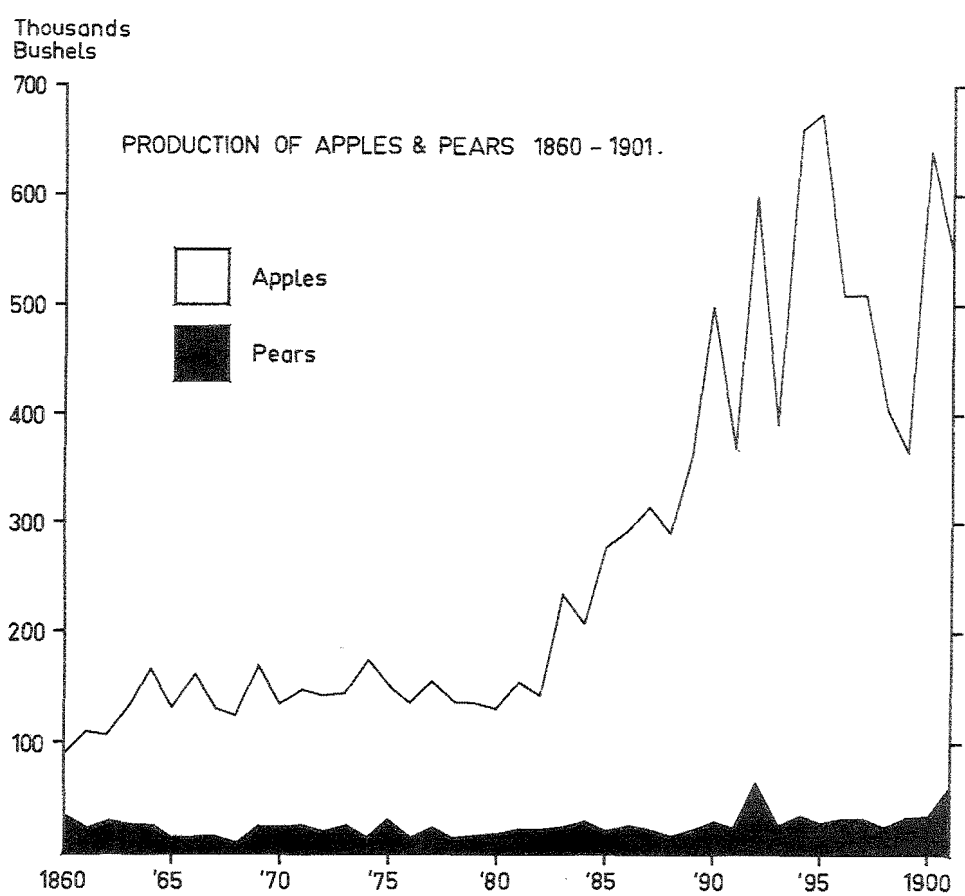


Fig. 4.

and Tasman Peninsula where orchard small holdings were carved out of the dense hardwood forests by pioneer-settlers who possessed little more than their own labour in the way of resources. This group of planters developed a commercial and monocultural farm economy based on apple growing. A more diversified type of commercial fruit growing was created in the Derwent Valley and the south-east on the large mixed holdings of established and prosperous 'gentleman' farmers. The second major phase of development from 1904 to 1922 was largely of speculative origins and led to large scale plantings in the north in the Tamar and Mersey Valleys, in many cases for absentee owners in India.

Commercialisation in all areas led to improvements in orchard cultivation and techniques of management, packing and presentation of fruit and in transport and marketing, improvements which were only within the scope of the highly specialised producer. This caused the almost complete neglect or abandonment of the casual farm orchard operated on a semi-commercial basis. "Only those growers who took advantage of new developments in plant improvements, pest control, pruning, thinning, tillage, fertilisation, harvesting and selling could survive the competition that ensued the general farmer faced the alternatives of expanding and intensifying his farm orchard enterprise, or of abandoning it."⁵⁶

A number of factors were responsible for the emergence of specialised commercial apple growing in Tasmania but undoubtedly the major stimulus initially was the good prices obtained on the colonial markets in the 1870's and early 1880's. A further and much greater incentive was the beginning of apple shipments to the United Kingdom in the late

56 Olmstead, C.W., 'American Orchard and Vineyard Regions', Economic Geography, Vol. 32, No. 3, 1956, p. 214.

1880's. This development was made possible by the introduction of fast and regular steamship services and by the use of refrigeration. However, the long distances, high costs of freight and quality conscious London market, necessitated the shipment of dessert apples of a high standard.

The recognition of the market possibilities and the adoption of commercial cultural methods to produce fruit of the required standards was due to the example of the success achieved by a few of the more enterprising orchardists; in particular to the Derwent Valley growers who were responsible for the first experimental shipments to the United Kingdom beginning in 1876, and for the introduction of such cultural practices as pruning, spraying and irrigation. But in all areas progress was greatly influenced by the example set by a small number of leading orchardists. Their profits from increased production, more regular cropping and improved quality of fruit, induced others to follow.

The change over from the casual farm orchard to a commercial enterprise was hastened by the enormous increase in the varieties and numbers of orchard pests and diseases. The codlin moth was outstanding in this respect but many others, notably the black spot, mussel scale, fire blight, apple rust, dieback and woolly aphis, all caused serious crop losses under favourable climatic conditions. For instance it was said of the disease mussel scale in 1896 that it, "is giving orchardists much trouble and causing losses, not only in fruit but also in injuring the trees affected. Its spread and increase in orchards already infected has been very rapid and it is becoming a menace to the fruit industry."⁵⁷ As plantings

57 Report of the Inspector for the Codlin Moth Act, Journals and Printed Papers of the House of Assembly, No. 46, 1896, p. 5.

increased and large concentrations of orchards appeared, pest control became a major cultural practice.

The improvements of internal transport greatly extended the areas from which fresh fruit could be transported to the ports, in the main to Hobart. The development of a regular river steamer service opened up the whole south-eastern coastline, while the Dennison Canal, completed in 1904, extended this service to the east coast.⁵⁸

Railway construction contributed largely to commercial orchard development in the Derwent Valley, the lower Midlands and at Lilydale, Scottsdale and Spreyton in the north. Nor can the introduction at this time of government guidance to the developing fruit industry be overlooked as a factor encouraging the development of commercial orcharding. Initially this took the form of orchard inspection to ensure adequate measures for preventing the spread of orchard pests. This was followed by the publishing of information and providing instruction in cultural practices, selection of site and root stocks, and later by the inspection of export fruit. Indeed in the northern speculative boom in plantings, many sites were planted mainly on the advice of experts in the Tasmanian Department of Agriculture.

1. The Growth of Commercial Orchardling in the South.

The pattern of commercial development in the southern districts is well summed up by a contemporary writing in 1892, "in the Huon the heavy rainfall and damp climate, and fertility of virgin soils fresh won from the dense forest produced a luxuriant growth of large sized fruit, and orchards

58 On the authorisation of the canal scheme over 200 acres of apples and pears were planted in the Marion and Oyster Bay areas - Glassford, K.W., 'The Dennison Canal', "Walkabout", 1st August, 1959, p. 30.

quickly spread along narrow valleys and crept up the steep hillsides, until it became the stable industry of a great part of the district and the main dependence of a number of small settlers."⁵⁹

In the 1870's agriculture in the areas south of Hobart was still on a very limited scale and confined to a number of scattered and relatively isolated localities. The rapid increase in orchard plantings which began at the time and continued until the early twentieth century, extended the confines of these small cultivated patches until many coalesced to form an almost continuous pattern of apple orchards following the water frontage. For throughout the period of commercial planting, proximity or ease of access to river or coastal transport was an essential locational factor. Each orchard homestead along the water front had its own landing platform for shipping fruit by river steamer or sailing barge.

The chief factor that prompted the commercial planting boom was the very remunerative prices obtained for apples sent to Victoria and New South Wales in the late 1860's and 1870's. The settlers were further encouraged by the widely held belief in Tasmania that climatic conditions would prevent the mainland colonies from growing apples in sufficient quantities to supply their own markets. The suitability of the Tasmanian climatic environment had been proven by the successful farm orchards of the pioneer settlers. Apple trees grew prolifically, as much as 6' feet in the year of grafting and the fruit were said to "surpass those of Great Britain in size and colour."⁶⁰ Huon apples were already

59 Shoobridge, W.E., 'Tasmanian Apples in London', Papers and Proceedings of the Royal Society of Tasmania, Hobart, 1892, p. ii.

60 Whiting, G., *Op. cit.*, p. 35.

well known throughout Australia for their distinctive flavour and remarkable keeping qualities. Led by a number of go-ahead settlers, heavy plantings of apple trees were made after 1870 and fruit growing gradually overhauled timber and general farming as the main source of income.

The first large scale commercial plantings were made on the river flats of the Huon and Mountain Rivers at Victoria (now Ranelagh), and as early as 1871 it was reported that, "the lower flats beside the river are almost wholly covered with orchards."⁶¹ The contemporary practice was to plant on rich soils and it was only a matter of a few years before the very limited amount of alluvial soils were planted up and orchards were being established on the flanking coastal and valley slopes. These orchards evidently thrived on the poorer soils, for in the Victoria district it was said in 1877 that even though, "The soil . . . is generally very poor, covered with cutting grass and fern, etc., but by cultivation can be made to produce apples, pears, etc., abundantly, many thousands of bushels of the former being sent to Hobart Town every year for exportation."⁶² This discovery proved to be of great significance for it found a profitable use for the poor soils on the relatively steep slopes - the most common type of land in the south - land which was of second class quality and could not compete with the more fertile bottom lands for general cropping. In fact the slopes proved to be actually preferable sites for growing deep rooted apple trees, since the deep and rich alluvial soils encouraged tree growth at the expense of fruiting. Thereafter, providing there was a clay subsoil, little attention was paid to the choice of orchard site and it was the maxim that, "an apple tree will

61 'Walch's Tasmanian Guide Book', op. cit., p. 71.

62 'Bailliere's Tasmanian Gazetteer and Road Guide', Melbourne, 1877, p. 215.

grow and bear good fruit wherever a gum tree will thrive."⁶³

Throughout the late 1870's and early 1880's the numbers of orchards and production were expanding rapidly, (Fig. 4), and prompted such comments as, "all over the Huon the fruit industry is being pushed ahead."⁶⁴ From a mere 9 orchards recorded in 1865, there was a big increase to 192 in 1874 to be followed by a relatively stable period in the early 1880's, in 1882 there had only been an additional 15 orchards planted. But plantings were again very heavy in the late 1880's and by 1893 there were 552 orchards in the Huon. The newly established orchards were evidently on an increasingly commercial scale as is suggested by the 1880 report of the Crop Collectors which said of the Huon, "for some years past settlers have been turning their attention to fruit growing at the expense of other crops, in particular wheat."⁶⁵

Commercial plantings spread south along the water frontage to Franklin, Shipwrights Point, Geeveston and Port Esperance (Dover), north and inland along the valley of the Mountain River and its tributaries and across the Huon estuary to Port Cygnet. On the D'Entrecasteaux Channel, fruit growing was well established at Margate and Woodbridge by the late 1870's, although generally commercial plantings were later than in the Huon Valley.⁶⁶ In 1879 the Huon Valley had clearly become the leading apple producing region - surpassing

63 Butler, F.F., 'Apple Culture', Proceedings of the Conference of Australasian Fruitgrowers, 1897, p. 48.

64 The Huon. Report of a Select Committee to the Tasmanian Parliament, Journals and Printed Papers of the House of Assembly, No. 138, 1886, p. 1.

65 Statistics of the Colony of Tasmania, 1880, p. 217.

66 'Bailliere's Tasmanian Gazetteer and Road Guide', Op. cit., p. 131 and p. 225.

the Hobart district - a position it has held ever since.

With the development of a market for Tasmanian apples in the United Kingdom and the realisation that second class land had considerable value for fruit growing, even heavier plantings took place in the closing years of the nineteenth century. Throughout the 1890's the planting of apple trees went ahead at an increasing tempo throughout the southern areas. The D'Entrecasteaux Channel, Bruny Island and Tasman Peninsula particularly became the scene of great activity as fresh land was cleared and put down to orchard. Apple production rose steeply in the Huon Valley from 34,000 bushels in 1879 to 115,000 in 1884, 206,000 in 1888 and 315,000 in 1893 when it produced almost half the total apple crop. (Table 8). In 1891 it was said that the fruit of the Huon Valley was, "equal if not superior to anything grown in the Australasia's."⁶⁷ Clearly the Huon was established in a dominant position with respect to both total production and the quality of its fruit.

Table 7 Acreages of Orchard - Huon Valley and D'Entrecasteaux Channel, 1865, '76, '86, '96 and 1906.

	1865	1876	1886	1896	1906
Franklin	464	1,064	2,244	3,324	5,454
Kingborough	-	474	610	630	1,252

Table 8 Production of Apples and Pears - Huon Valley and D'Entrecasteaux Channel, 1865, '76, '86, '96 and 1906. (Bushels).

	1865	1876	1886	1896	1906
Franklin					
apples	13,769	33,932	147,816	196,635	589,376
pears	148	929	3,802	9,168	47,000
Kingborough					
apples	-	7,898	15,000	20,000	61,000
pears	-	905	2,767	3,000	9,254

Source. Tasmanian Statistics.

67 Johnston, R.L., 'The Tasmanian Official Record', Hobart 1891, p. 70.

The southern orchards were characterised from the onset by their small size, the intensity of cultural practices and the almost complete dependence on apple growing. This created in the Huon Valley in particular, a uniquely specialised farm economy, in sharp contrast to the developing commercial orchards on the large mixed farms of the Derwent and the south-east.

The factors mainly responsible for this pattern of development were firstly the physical environment, principally the dense forest cover - even though much of the woodland had been cut over - and secondly the socio-economic conditions of the settlers. The dense hardwood forests greatly handicapped the farmer, for clearing by felling was arduous and regeneration of suckers, even after burning off, was very rapid. The intending orchardists were either sons of pioneer settlers or new arrivals from Britain,⁶⁸ in both cases lacking capital equipment to clear and work their small family holdings other than by hand labour.

In the early stages of clearing and planting the intending orchardist lived a near subsistence existence similar to his pioneer predecessor. Many new settlers worked for neighbours or at local timber mills, clearing their own land at night by moonlight or on Sundays. As much food as possible was grown around the homestead and timber from the holding could be split for palings and shingles and sold in Hobart for cash purchases. Small fruits were often grown to tide the settler over the initial stages, for it was a type of crop that could be quickly brought into production without great expenditure and was well suited to intensive cultivation.

68 In the Port Cygnet area more than 50% were Irish - elsewhere English predominated with the Irish a strong minority.

Raspberries, strawberries, gooseberries, black and red currents were planted in small cleared or partially cleared areas and provided quick though small cash returns. So in a variety of ways a livelihood was made until the first orchard plantings came into full bearing, in the south Huon as long as 12 years after planting.

The first orchard blocks were necessarily small, up to 4 acres in extent, but where the woodland was very dense, 1 to 2 acres was more usual. The trees were planted as close as possible - usually 14 to 16 feet apart - to make the maximum use of the cleared ground, but even closer spacings of as little as 10 feet apart were adopted on poor soils on steep slopes.⁶⁹ Hand labour was used throughout, few orchardists had implements and many even hired a horse and plough for cultivation. New-comers largely became experienced in growing fruit by trial and error and by copying the methods of local experts. A number of factors did favour the new planter; the lack of orchard pests in the 1870's and 1880's, the virgin soils which did not require fertilisers and the use of family labour all combined to keep costs of production low and to reduce overheads. Profits in the early years were often high and were used to clear more land and to plant new orchard blocks. However, the fact that many southern orchards have taken over 50 years and two generations to reach their present size and productivity is an indication that the present success was achieved only by the dogged hard work and enterprise of the pioneer planters.⁷⁰

69 In the 1880's the Huon had the least farm machinery of all the Tasmanian municipalities.

70 From information supplied by a former Huon orchardist, Mr. Thompson of Electra.

In retrospect the development of commercial orcharding in the Huon Valley seems to have been fortuitous, for, "in the long run it was only the peculiar circumstances of a specialised type of farming, that of apple growing, which saved the Huon farmer from the poverty inevitable with too small holdings."⁷¹

2. Commercial Plantings in the Derwent Valley and the South-East.

Commercial fruit growing in the Derwent Valley was introduced by well established and prosperous mixed farmers who enlarged and placed on a commercial footing pre-existing farm orchards. The expansion of commercial plantings appears to have been greatly influenced by several go-ahead farmers - in particular the Shoobridge family - who recognised the potentialities of the expanding colonial markets. Significantly it was the Derwent Valley growers who later pioneered overseas shipments, several of whom visited the United Kingdom to explore the possibilities. The first commercial plantings in the Derwent were made in the late 1860's and these spread gradually along both banks of the river in the vicinity of New Norfolk. However, production of apples remained small until the 1880's, (Table 9), when the effects of increased tree plantings made in the mid-1870's became apparent. The apple crop rose from 22,000 bushels in 1880 to 40,000 bushels in 1886, 60,000 bushels in 1889 and 100,000 bushels in 1893 - when it amounted to a quarter of the total state crop and the Derwent ranked second only to the Huon Valley.

Commercial plantings were heavy in the closing years of the nineteenth century and the early part of the twentieth century. Orchards spread along the upper Derwent to Uxbridge,

⁷¹ "The Huon and Derwent Times", 17th August, 1939, p. 11.

Ellendale and Hamilton and up the tributary valleys into the higher rainfall and densely forested areas resembling the Huon. In the lower Derwent a number of small fruit growing centres were established, at Glenorchy, Bismarck (Collinsvale), Moonah and Newtown on the western shore and at Bridgewater, Risdon, Lindisfarne, Bellerive, Rokeby, Sandford and South Arm on the eastern shores. Similar developments took place in the lower Midlands and the south-east with commercial plantings on a considerable scale taking place at Bagdad, Kempton, Richmond, Colebrook, Cambridge and Sorell. (Table 9). After large and often indiscriminate plantings throughout the first decade of the twentieth century, this region in 1914 had over 32% of the bearing apple trees and 35% of the pears, and closely rivalled the Huon Valley in importance. (Fig. 5).

Table 9 Acreages under Orchard - Derwent Valley and South-East, 1876, '86, '96, 1906 and '16, by municipalities.

Municipality	1876	1886	1896	1906	1916
New Norfolk	361	890	1,079	1,764	1,858
Brighton	110	264	295	975	2,073
Clarence	76	216	241	911	1,842
Glenorchy	254	517	725	1,441	1,944
Green Ponds	75	76	88	307	612
Richmond	138	157	173	328	685
Sorell	125	124	69	258	667

Source. Statistics for the Colony and State of Tasmania.

N.B. Figures for 1876 and 1886 are for orchards and gardens, in 1896, 1906 and 1916, for orchards only.

As in the Huon Valley, transport and accessibility were major factors in the developing pattern of commercial orchards for the mid-Derwent Valley had good access by river steamer to Hobart. Further development was largely due to the construction of railways in the south between 1872 and 1890. The line from the north to Hobart opened up the

lower Midlands and the south-east, while a branch line to Apsley was immediately followed by the planting of commercial orchards in the Dysart Valley at Bagdad.

The physical environment of the Derwent Valley contrasted strongly with that of the Huon Valley. Rainfall was much lighter, less than 25" annually in the main valley. Consequently orchards were laid out on the alluvial flats where they could receive drainage water from the flanking valley slopes and where irrigation could be practised. A Derwent Valley orchardist in 1892 described conditions as being, "dry and arid, and the system of fruit growing especially apples, that has been successful in the Huon, failed when applied to the upper Derwent. But small patches of the river flats near New Norfolk that receive drainage from the hills, and some that were irrigated for hops were found to produce excellent fruit."⁷² The Derwent grower was usually able to plant his orchards on land already cleared and cultivated, laying out large blocks and drawing upon capital reserves built up from other branches of his farming enterprise.

The resulting orchard economy was consequently very different from that of the Huon growers. The Derwent Valley in the latter half of the nineteenth century was already noted as a rich mixed farming region. Farms were large, many over 1,000 acres and orchards although on a commercial basis, were operated in conjunction with other horticultural crops - hops and stone fruits - with grain and root crops and with livestock - sheep, beef and dairy cattle. Rarely were growers dependent on apples and pears for even a major part of their income. Though orchards consisted predominantly of apples and pears, frequently they were mixed with a variety of stone fruits - apricots, plums, peaches and cherries. Individual

72 Shoobridge, W.E., op. cit., P. 2.

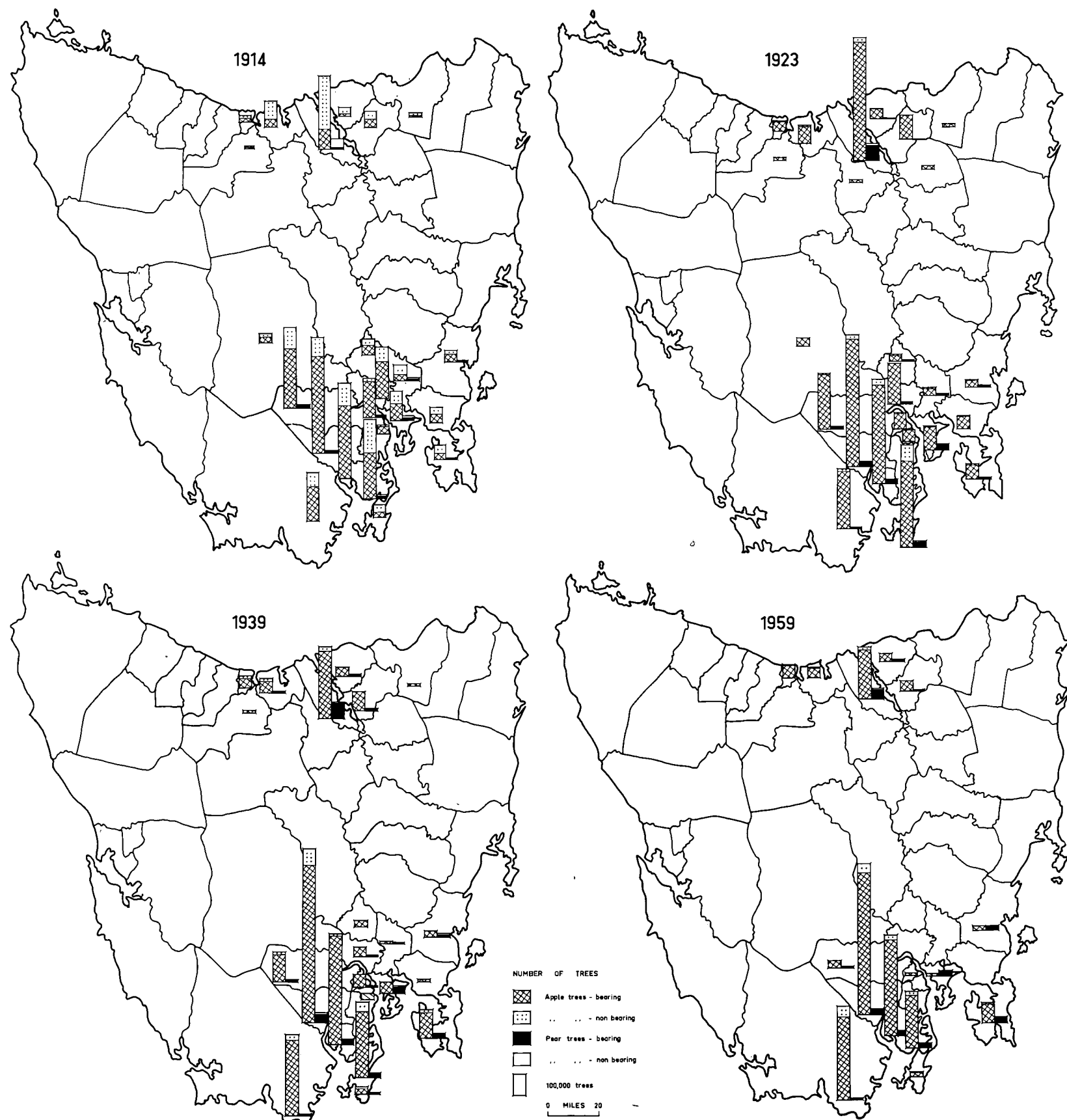
orchard blocks were large, often 40 acres and more. Many of the innovations in orchard culture and management were introduced by the wealthy gentlemen farmers of the Derwent Valley - notably pruning for tree shape and irrigation. For instance in 1873 it was reported that growers at Glenorchy were, "making considerable improvements in mode of cultivating especially in orchards and hop gardens."⁷³ It is probable that at least some of these improvements were brought back from overseas visits made by several Derwent Valley growers to Europe and North America.

The pattern of commercial development was a similar one in the lower Midlands and south-east. The commercial orchards were enlarged farm orchards on large holdings practicing general farming - combining orcharding with grain cropping and sheep rearing - and in general the orchard economy was much less intensive than on the orchard small holdings of the Huon Valley.

3. The North and the Planting Boom, 1904 - 1919.

Throughout the early years of the twentieth century large scale plantings continued in all the southern orcharding districts and were especially heavy on the D'Entrecasteaux Channel and Bruny Island. (Fig. 5). The pattern of development was, however, one of continued steady growth and new plantings rarely amounted to more than one quarter of the total number of trees. By contrast in the north in the Tamar and Mersey Valleys, entirely new orchard regions were created as a result of land speculation in an artificial boom initiated by local land agents and promoting companies. The new settler planters were of a very different type from those who had painstakingly planted orchards in the south, being in the

73 Statistics of the Colony of Tasmania, 1873, p. 194.



♦ Fig. 5 Distribution of Apple and Pear trees, Bearing and Non-bearing. 1914, 1923, 1939, and 1959. (by municipalities)

main urban business men or absentee investors, especially from British India. Although the northern areas were generally physically suitable for fruit growing, orchard land was selected as to availability rather than for suitability. This type of speculative development attracting absentee buyers had many parallels elsewhere in the early twentieth century, notably in the Nelson province of New Zealand from 1911 to 1916,⁷⁴ in the Okanagan Valley of British Columbia and in the Pacific states of the United States from 1905 to 1915.

Paradoxically speculation in orchard land first became prominent in the south, when at the turn of the century, speculators were at work in all branches of the orcharding industry. Land prices rose steeply and in 1900 a full bearing orchard was worth from £100 to £250 per acre⁷⁵ (£90 to £150 is the present value) with many shipping agents and merchants anxious to enter the producing side. It became fashionable also for local professional and business men to buy a young orchard as an investment for retirement. As early as 1896 Hobart business men were planting orchards at Bagdad in the Dysart Valley and in 1903 a large Hobart fruit processing firm purchased an 8,000 acre estate at Triabunna as a speculation, eventually laying out 452 acres of orchard. But speculative orchards never amounted to more than a small fraction of the total southern plantings, whereas in the north the bulk of the new plantings had speculative origins.

74 Where Tasmanian methods of planting were adopted, Fielding, G.J., 'Commercial Orchardling in New Zealand,' New Zealand Geographer, Vol. XV, No. 1, April, 1959, p. 44.

75 The Tasmanian Culturalist, 27th July, 1904.

Table 10 Distribution of Orchardists and Fruitgrowers, 1901,
 (by municipalities).

Hobart	23
Launceston	1
Selby (West Tamar)	6
New Norfolk	65
Sorell	18
Kingborough	220
Franklin	260
Glenorchy	69
Brighton	22

684

Source. Census of Tasmania, 1901.

As late as 1901 the Tamar region was not even remotely considered an orcharding district, "with very few exceptions there are no orchards worthy of the name, they are for the most part merely a few old trees, the wrecks of former years, uncultivated, unpruned and all more or less infested with codlin moth."⁷⁶ Nor were the prospects of development considered as favourable, for the Tamar was handicapped by distance from a railway, by rough roads and bad infestation with orchard pests. Yet by 1919 Beaconsfield on the West Tamar was the leading municipality with respect to the total numbers of apple and pear trees, and the Tamar region had the state's largest plantings of pears and was second only to the Huon in plantings of apples.

The Tamar Harbour League appears to have been directly responsible for initiating orchard plantings in the north. This body was formed in 1903 to develop trade in the north and due to the boom in shipments of fruit to the United Kingdom at this time, it was logical that the development of commercial orcharding should be a major proposal. The suggestion attracted the attention of land development companies and syndicates who bought up large estates cheaply

76 "The Agricultural Gazette of Tasmania", December, 1901,
 p. 133.

in part cleared for sheep and mixed farming, and had them subdivided and set out with apple and pear orchards. These organisations were chiefly local land and real estate companies, centred on Launceston. Similar development at Spreyton on the Mersey was sponsored by Devonport land agents.

The companies were mainly concerned in attracting overseas capital investment and to these ends agents were sent overseas, especially to India, to solicit investment from non-resident owners. The orchard land was then cleared, fenced, trees planted, the orchard ploughed and cultivated until such a time as the absentee owner could take over his own property. This type of investment proved very popular and in 1914 the Tasmanian Department of Agriculture reported that, "In the Tamar and Mersey Valleys considerable areas are being planted for absentee owners, chiefly Anglo-Indians."⁷⁷ In 1916 one firm alone was reported as holding nine estates on the West Tamar and managing nearly 2,000 acres for absentee owners,⁷⁸ while in all some £500,000 was invested in the orchards of the Tamar and Mersey. Active government encouragement was given to this type of speculative development with the distribution of literature on the subject in India and by the appointment of fruit instructors whose work consisted of giving advice and, "General supervision respecting the clearing and preparation of the lands the selection and planting of trees, and the care of young orchards that have been planted out on behalf of absentees, mainly Anglo-Indians who propose eventually settling in the state, and who look to fruit growing as their main source of income."⁷⁹

77 Agricultural and Stock Department Report for 1913-14, p.29.

78 "The Tasmanian Fruit Grower", 8th July, 1916, p. 5.

79 Agricultural and Stock Department Report, Loc. cit., p.7.

The tempo of plantings increased yearly reaching a peak in 1911 on the Mersey, when more than 30,000 apple trees were planted at Spreyton⁸⁰ and in 1916 on the Tamar when over 150,000 apple and pear trees were planted. In the case of pears the number of trees almost doubled between 1914 and 1916 from 49,000 to over 90,000. Acreages under orchard rose steeply, from 1,461 acres on the Tamar and 425 on the Mersey in 1909 in the early stages of the boom, to 4,930 acres and 1,471 acres respectively in 1913, and reached a peak of 8,587 acres on the Tamar in 1916. Large plantings were made at Freshwater Point, Rosevears, Exeter, Glengarry, Deviot, Beaconsfield, York Town and Kelso on the West Tamar, at Newnham, Dilston, Lilydale, Karoola and Hillwood on the East Tamar, and at Latrobe, Spreyton and Devonport on the Mersey. A peak in tree numbers was achieved in 1919 when the Tamar and Mersey together had over one million apple trees - 25% of the state total - and 135,000 pear trees, which was no less than 40% of the total.

In general the northern planters paid little heed to physical factors in the choice of site. As large estates came onto the market they were bought up, sub-divided and planted with orchards, producing a pattern of a number of scattered concentrations, each corresponding to the sporadic distribution of the sub-divided estates. Perhaps the only locational factor which could not be ignored was the need of access to a means of cheap bulk transport. The northern orchards therefore occupied sites affording either the use of water transport, as for instance on the Tamar, where the fruit could be transported down to river jetties and taken to Launceston or be picked up direct by interstate freighters, or with access to the state railway system for transport to Launceston and Hobart, as was the case at Spreyton, Lilydale, Scottsdale and the

80 Personal interview with Mr. C. Viney, orchardist, Spreyton.

districts in the vicinity of Launceston.

The northern orchardist was very different in type and origins to his southern counterpart. Orchards were bought by people from all callings and all parts of the Commonwealth, Empire and overseas countries. Residents of India, Ceylon, Britain, South Africa, the Malay States, Siam, together with many from the mainland states and other parts of Tasmania, purchased Tasmanian orchards to provide a competence for retirement. They were composed of men of varied professional and business origins ranging from Indian Army officers to English business men, an ex-minister of the Navy, university professors, civil servants, clergymen and school teachers.

The pattern of plantings in the north varied markedly in a number of respects from the earlier southern development. The Tamar orchardists followed the Victorian system of wider spaced plantings (18 feet apart) with blight proof Northern Spy root stocks, considering the southern system of close tree spacing on seedling stocks a poor one. In general there was a more scientific and commercial approach as could be expected with these later plantings. The wider tree spacings were an aid to orchard cultivation and spraying. Shelter belts of quick growing Monterey pines (*pinus radiata*) were frequently established around new plantations in the closing years of the boom. Orchard blocks were far larger - up to 20 acres - and likewise orchard holdings which were rarely less than 50 acres. Pears were planted extensively for the first time in Tasmania, for instance in 1918 of the 169,000 young pear trees, 112,000 were on the West Tamar, while the proportion of pears to apples was 6 to 1, in contrast to a ratio of more than 25 to 1 in the Huon. But what was in greatest contrast to the south was the speed at which orchards were

established on the Tamar and Mersey, the land being cleared, fenced and planted within a year.

The 1914-18 war and the cessation of apple shipments overseas in 1917 slowed the tempo of the boom. By this time it was becoming evident that many orchards were a failure and were never likely to reach commercial production. In the Tamar the numbers of apple trees declined from the peak of 908,000 in 1919 to 657,000 in 1923, with many trees never reaching maturity. The high proportion of orchard failures was due in a large part to the very character of the speculation development. Many unsuitable sites had been planted, usually without adequate information. As a result of hard pan soil formations, poor drainage or exposure to strong winds, some orchards had to be completely abandoned. The Northern Spy blight proof root stock proved to be unsuitable for Tasmanian conditions for, "After some years of growth it became apparent that though woolly aphis was controlled to some extent, this advantage was more than offset by the production of comparatively small trees with poor root anchorage under open conditions."⁸¹ The stunted trees together with wide spacings meant that orchards were under-planted with uneconomic plant and ground coverage. Under the system of absentee ownership it was inevitable that many young orchards received inadequate attention and management at a time when orchard care needs to be most efficient. In addition due to excessive management costs, many absentee owners became unfinancial and these orchards were abandoned. Perhaps the most unsatisfactory aspect was the misleading information disseminated by the developing companies and in some degree by the Tasmanian

81 Raphael, J.D., 'Notes on Clonal Apple Rootstocks in Tasmania', The Tasmanian Journal of Agriculture, November, 1958, p. 348.

Government. Acting on this information Anglo-Indians invested their life savings in orchards only to find on their arrival in Tasmania that an orchard would not mature in five years, as for example was widely stated. Many came and saw their purchases and left immediately without ever taking possession. Others tried to make their holdings pay, but lacking practical experience, failed. The abandoned orchards became derelict and were eventually sold by the municipal councils in lieu of rates to local purchasers. Significantly the majority of orchards that have survived were taken over by local people who were conversant with local conditions and who have since built them up into profitable holdings.

An example of this type of speculative development and eventual failure took place at Kelso on the West Tamar. Here an estate of 1,300 acres was purchased by a Launceston real estate firm in 1913 and was sub-divided into 35 blocks, 25 of which were subsequently sold to Anglo-Indians and the balance to local people. The planting operations were supervised by the government agricultural officer. However, a number of orchard blocks were gradually abandoned as it became apparent that physical conditions were unsuitable and some absentee owners became unfinancial. The poor undrained soils containing hard pan formations, together with planting on unsuitable rootstocks and exposure to strong winds, resulted in no block ever reaching commercial production.⁸²

The character of the speculative development in the north differed in a number of spheres from the southern planting. In part this stemmed from the type of settler who was predominantly of a sophisticated and well educated background and possessed considerable economic resources. Consequently

82 From the 'Tamar Orchard Enquiry', The Journals and Printed Papers of the Tasmanian Parliament, 1921, No. 8.

the whole tempo of northern development was very rapid and there was no pioneer subsistence phase, indeed many orchard owners lived overseas during the period in which their trees were non-bearing. Orchard blocks were cleared and planted in as little as one season without acquiring an adequate knowledge of the capabilities of the soil. Many of these speculative orchards never came into full-bearing or at the best remained sub-marginal. At no time was development based on the same solid economic foundations as in the south where opportunity had dawned after years of niggardly hard work and where it could truly be said successful fruit production was the out-growth of regional experience.

4. Changes in the Orchard Economy.

Commercialisation and specialisation accompanied by new market demand for quality, revolutionised the techniques of orchard management and cultural practices. The whole orchard economy turned from one of casual attention given to a small farm or house orchard to a highly intensive commercial economy. In the Huon Valley apple and pear production provided the grower with his only source of income. Production and yields rose and were as high as 200 to 400 bushels per acre in the 1890's. Great strides were made in the fields of orchard cultivation, pruning, spraying, crop thinning, irrigation, provision of shelter belts and the selection of suitable varieties. The uncared for pest ridden farm orchard and urban fruit garden did not merit investment in or allow the efficient use of spraying, pruning, tillage and harvest equipment.

Inter-row cultivation of orchards was becoming standard practice by the 1890's.⁸³ In the Huon Valley this

83 Report on Orchard Insect Pests and Blight, op. cit., p. 6.

consisted of ploughing in grass and weeds in autumn or early winter and harrowing the land in spring. In small orchards cultivation around the roots of individual trees was done by hand digging. The object of clean cultivation was primarily to conserve moisture in summer by maintaining a pulverised surface layer. The turned in green matter also provided a supply of nitrogen for the trees, though artificial fertilisers were also used.

The small (8 to 10 feet in height) neatly pruned trees of the newly planted commercial orchards presented perhaps the most striking contrast to the tall over-grown trees of the semi-commercial farm orchards - many of which were 20 - 25 feet high with 10 feet of trunk before branching. The cup shaped, wine glass or inverted pyramid form became the fashionable tree shape, "formed by a number of branches radiating from the stem, a short distance from the ground." Introduced by a Derwent Valley grower it was universally adopted since it, "was found to be the best shape to allow free access of light and air to every part, as well as easiest to pick and prune, and least liable to damage from winds."⁸⁴

The codlin moth and the widespread damage it caused to orchards in the 1870's and 1880's necessitated the introduction of spraying as a means of pest prevention. The large scale concentrations of commercial plantings brought with them a wholesale increase in both the varieties and numbers of orchard pests and diseases. The codlin moth, black spot, mussel scale, woolly aphis, fire blight, light brown apple moth, apple rust, dieback and bitter pit were increasingly destructive. By 1890 spraying had begun on many orchards on an experimental scale and in the late 1890's was becoming standard practice.⁸⁵

84 Shoobridge, W.E., op. cit., p. ii.

85 In 1899 New South Wales decided to prohibit the entry of marked fruit so forcing Tasmanian orchardists to tackle the problem of black spot or lose their best market.

80.

Irrigation of orchards has only become widespread practice in recent years. In the early years of commercial development irrigation was confined to a small number of orchards planted on the river flats of the Derwent. Here irrigation was born of necessity for low average rainfall and frequent summer droughts gave widely fluctuating yields. For instance in 1879 the orchards of the whole of the New Norfolk municipality failed except where irrigated.⁸⁶ However, irrigation at this time was not popular with the growers who held, "a strong though unreasoning prejudice . . . against fruit grown by artificial watering, as it was said to be soft and green, though large and destitute of flavour and keeping qualities."⁸⁷

The planting of windbreaks was a further innovation of the commercial period, especially in those orchards planted towards the end of the planting boom in the north. Shelter belts of monterey pine (*pinus radiata*) and lombardy poplar were planted around more exposed sites, particularly where open to the sea. In the south orchardists were able to make use of natural shelter from the dense eucalypt woodland.

The selection of apple varieties was a feature of the new commercial orchard. For the first time apple and pear stocks were selected for the colour, shape and keeping qualities of their fruit (flavour was notably largely ignored) and not according to the whims of the individual grower. In the 1890's the Scarlet Pearmain, Adams Pearmain, Sturmer Pippin, New York Pippin and French Crab were the most popular stocks used.⁸⁸ In particular the Sturmer, Scarlet and French Crab

86 Statistics of the colony of Tasmania, 1879, p. 215.

87 Shoobridge, W.E., op. cit., p. ii.

88 Butler, F.F., op. cit., p. 46.

which were, "pronounced by experts in the London trade to be the best in flavour and appearance to please the English customer,"⁸⁹ were extensively planted. These varieties were the best of many long grown in Tasmania, however, subsequent developments have led to their being replaced by new varieties especially propagated to meet the exacting requirements of overseas markets. Trees were planted on the square pattern with two rows or so of each variety and in general the early commercial orchardist grew a much greater number of varieties than his modern counterpart.

Pears were planted in small numbers in the early stages of commercial development when there seemed to be little prospect of overseas exports. Plantings of pears on a considerable scale only took place on the West Tamar when packing, storage and refrigeration had improved sufficiently to allow overseas shipments in quantity. Nevertheless, pears have remained very much a subsidiary to the primary concern of growing apples.

Although it was perhaps the improvements effected in methods of fruit production that were of the greatest significance, it is appropriate to remember that commercialisation expressed itself not just on terms of farm specialisation, but also in improvements in methods of packing and presentation, transportation and marketing and in the growth of subsidiary industries such as case making and fruit processing.

5. The Expansion of Trade, 1880 to 1917.

1) The colonial markets.

The new orchard plantings made predominantly on a commercial basis had caused apple production to rise from under 200,000 bushels in 1880 to over 500,000 bushels in 1890

89 Shoobridge, W.E., op. cit., p. iii.

and it seemed likely that, "the supply of apples could soon exceed the demand of the colonial market."⁹⁰ The other colonies were also showing increasing reluctance to accept unlimited quantities of Tasmanian fruit owing to the large plantings of orchards being made on the mainland. Victoria was the first state to raise a tariff to protect local growers, imposing an import duty of 9d. a case in 1879, later rising to 1/6d. per case. This proved almost prohibitive to Tasmanian growers and apple exports to Victoria fell sharply in the 1880's (Fig. 3). The other states quickly followed this example, South Australia raised a 9d. duty in 1887, West Australia a 10% duty⁹¹ and New South Wales a duty of 9d. a case, though fortunately this was soon removed. New Zealand introduced a tariff of 1/2d. per lb. in 1888 due similarly to pressure from local growers and her own rising production. Tasmanian growers viewed the situation with alarm, as one Huon orchardist described the situation, "We want fresh markets and in a few years shall want them still more, as the colonial demand is not at all likely to keep pace with our increasing supply, especially in the view of local production of fruit in the other colonies."⁹² The alternatives were a declining industry or new markets, the annual report of the Council of Agriculture for 1883 summed up the situation as follows; "The hostile tariffs of the sister colonies . . . and the limited population of the Australia's, combined with the growth of home production, form a barrier against any successful trade being done in green fruits. It is to the Antipodes we must look for profit-

90 Shoobridge, W.E., op. cit., pp. ii - vi.

91 These states also wished to keep out Tasmanian fruit to prevent the entry of pests into their young orchards.

92 Correspondence - Mr. E.H. Thompson to a Mr. Bird, 17th November, 1888. Premier's Department Records, 1887 - 1888.

able trade in green fruit."⁹³

ii) The development of the overseas trade.

Tasmanian fruit growers had long been aware of the enormous potential market in the large urban centres of Britain where the difference in seasons eliminated the possibility of any competition from local supplies. Some growers had even made small experimental shipments of apples in lots of up to 100 cases, the first as early as 1828,⁹⁴ others in 1868,⁹⁵ 1870 and 1876, and it is likely others went by unrecorded. But the results were always unsatisfactory and the fruit when unloaded was found to be decayed or at the best in a flabby condition. Then in the 1880's two developments occurred that radically changed the position. The first was the establishment of a regular steamship service between Britain and Australia which ensured a rapid and regular freight service. Even more significant was the adoption of refrigeration, available after 1885 in the holds of steamships for the conveyance of perishable cargoes. Refrigeration was first used in the export of New Zealand lamb to Britain, but Tasmanian orchardists, notably in the Derwent Valley, were quick to perceive its wider application, and several Derwent apple growers made trips to Britain with the objective of developing a fruit trade.

The earliest shipment of apples by steamer to Britain took place in 1884, the first shipment in refrigerated chambers (at a temperature of 55°F) followed in 1887 when a

93 Council of Agriculture, Tasmania, Annual Report, 1893,
p. 9.

94 "The Colonial Times", 3rd July, 1829.

95 "The Tasmanian Times", 5th April, 1868. A Sandy Bay nursery man sent a case of mixed apples - Sturmer Pippins, Parsons Plate and Scarlet Non-Pariel - the shipment was 114 days in transit and on arrival only the Sturmers were in good condition, although they had lost their crispness

04.

a consignment of 1,300 cases left on board the S.S. Garonne. From this time the trade grew yearly and as early as 1889 it was said that, "Already Tasmanian apples have won some reputation in England and now that growers have learnt what is required in regard to packing and arrangements are being perfected for their shipment in cool stores of fast steamers, it may be confidently hoped that a considerable trade in this product will be developed between Tasmania and the mother country."⁹⁶

All did not go smoothly at first and the initial apple shipments carried in cool chambers were treated like meat and frozen solid, being completely inedible when unloaded. The cost of freight was extremely high⁹⁷ and the fruit had to be transhipped via Melbourne to be put on board the mail steamers. This necessitated much handling and the consequent bruising of the fruit - pre-mature decay was a serious problem in this period. Many of the pioneers of the overseas fruit trade suffered heavy losses in these early years⁹⁸ - all the fruit being consigned. But some persisted, and within a few years satisfactory cool storage conditions and ventilation ensured a high percentage of profitable shipments, for instance in 1891, 110,000 bushels out of the 130,000 bushels shipped arrived in London in sound condition.

During the 1890's and early part of the twentieth century, the fruit trade with Britain grew steadily (Fig. 3), and in the early years when it was something of a novelty,

96 Proceedings of the Royal Colonial Institute, 1888-89,
Vol. 20, p. 330.

97 Due to representations by the Tasmanian Government, freight charges were reduced in 1894.

98 Some even to the extent of losing their holdings, the position being worsened by the closure of the Van Diemen's Land Bank in 1893 and the calling in of mortgages.

99.

Tasmanian apples brought high prices on the London market.⁹⁹ There was a ready market in Britain for high grade dessert apples and a definite season existed for Tasmanian fruit from April to August when there was little opposition from other types of fruit or from other producers. An unusual and important feature of this market development was the prior existence in both Tasmania and Britain of the facilities and organisation for handling and marketing fresh fruit. In Tasmania this was due to the earlier development of a large colonial trade and in London because of a large import trade with North America, for example in 1882, 2,386,800 barrels of apples were landed in London,¹⁰⁰ half of them from the United States. This factor must have contributed largely to the smooth expansion of the overseas apple exports.

The overseas trade was characterised by its highly commercialised nature in contrast to the irregularities in exports to the colonies. A more discriminating and quality conscious market and the high rates of freight, necessitated regular shipments and far greater regard to quality, packing and presentation. The London market asked for, "good, bold, showy apples,"¹⁰¹ of uniform size, individually wrapped and packed in presentable cases. Many growers failed to recognise these requirements at first, for instance in 1891, "Large quantities of apples were sent from Tasmania, many were placed in rough, paling boxes and the fruit appeared to be poured in

99 80% of the fruit was sold in London. When fruit did arrive in good condition it fetched high prices - Tasmanian apples sold for 4d. each in London in 1889.

100 Taylor, W.A., United States Department of Agriculture Year Book, 1897-98, pp. 308 - 340.

101 The varieties most in demand were, Sturmer Pippin, French Crab, Scarlet Non-Pariel, Adams Pearmain and Ribston Pippin. Colour and keeping qualities were at a premium rather than flavour.

without any care. Some of the samples were wretched - no colour."¹⁰² However, from the late 1890's apples were being graded and sorted, and by 1900 the wrapping of individual fruit and packaging in a standard bushel case were well established practices.¹⁰³ Factors such as these did much to hasten the change over to commercial orcharding in Tasmania.

Efforts were made to open up other overseas markets. Trial shipments of apples were made to California, British Columbia and Syria. Small and infrequent lots were sent to India and Ceylon while ships returning to Europe via Cape Horn took on cargoes of apples at Hobart to be sold in Buenos Aires. In 1901 the first shipments were made to Germany so initiating the now important trade with Western Europe.

iii) Expansion of the interstate trade - The Act of Federation, 1901.

The inter-colonial trade likewise expanded in this period. New South Wales remained by far the best customer, Queensland increased her imports but shipments to Victoria and New Zealand continued to fall due to tariff restrictions, (Fig. 3). Expansion of this trade was greatly stimulated by the Act of Federation in 1901 which automatically removed inter-colonial duties and tariffs. By 1914 Tasmanian fruit shipments to the other Commonwealth States had reached a total of more than 1,000,000 bushels. The fruit industry had become first in value of the state's primary production, a position it has held in all but a few years ever since.

iv) The dominance of Hobart in the fruit trade.

In this period the production and export of apples was concentrated in the south. Hobart was both the leading port and the commercial centre of the surrounding orchard

102 Annual Report of the Inspector for the Codlin Moth Act, Journals and Printed Papers of the House of Assembly, No. 52, 1891, p. 5.

103 Apples were still sent unwrapped to the colonial markets.

districts in the middle and lower Derwent, the lower Midlands, Tasman Peninsula, the D'Entrecasteaux Channel and the Huon Valley. Situation at the heart of a network of sheltered waterways formed by the Huon, D'Entrecasteaux Channel and the Derwent, Hobart was the natural collecting centre. The export fruit was packed in the apple houses on the orchards and then taken by sledges or carts drawn by bullocks or horses to the nearest jetty, there to be picked up by the Hobart bound river steamers.

The development of the London market served to emphasise Hobart's dominant position, for the largest steamships could use the port and no other Tasmanian port had the necessary marketing facilities. Though commercial plantings in the north were well underway early in the twentieth century, they were not yet in production. The small quantities of fruit grown in the north, as for example at Scottsdale and Lilydale, were sent by rail to Hobart. Until the early 1920's Hobart was the only overseas port and in addition overwhelmingly dominated the interstate trade. For example, of the 530,141 cases of Tasmanian green fruit exported in 1899, no fewer than 523,708 were despatched from Hobart. Launceston and the ports of the north-west carried on only a small trade with the mainland. This northern trade began to expand in the years immediately prior to the outbreak of the first world war as commercial orchards on the Tamar and Mersey came into production. For instance in 1898 Launceston shipped only 3,450 cases to the mainland, in 1914, 41,915 cases were sent and in 1919, 128,000 cases.

6. The End of the Planting Boom.

The boom in commercial plantings reached a peak in 1915 when Tasmanian orchards contained 4,420,000 apple trees of which 1,765,000 were non-bearing. The peak in bearing

acreage was not reached until 1922 with 26,700 acres. However, this peak masked the true state of the orcharding industry which had already entered a period of decline. The fall off in new plantings was most marked in the areas of speculative plantings on the Tamar and Mersey but was prominent in all regions by 1919.

The major cause of the sharp fall in new plantings was the effects of the world war on the overseas export trade. Until 1916 shipments maintained their pre-war level, but in the 1917 season the United Kingdom government imposed an embargo on apple imports owing to heavy shipping losses from German submarines. When hostilities ceased in 1918 normal overseas trade was only resumed slowly, due to the scarcity of shipping space resulting from war time losses and stringent quarantine regulations - imposed during the world wide influenza epidemic - which hindered loading operations. The unsettled market position, together with the failure of many young orchards in the north, effectively destroyed the wave of optimism which had been largely responsible for the commercial boom. By 1919 the industry was entering a new phase of modification and retrenchment in the pattern of production and markets.

7. Changes in the Distribution of Pome Fruit Orchards, 1915-22.

The regional distribution of bearing apple trees in 1922 showed several distinct changes from the peak in total tree numbers reached in 1915 and when production was dominated by the Huon Valley, the Derwent and south-east. All regions experienced a considerable increase in numbers of bearing trees, though the total of 3,780,527 suggests that many new plantings never reached bearing age. Understandably the greatest increase took place on the Tamar where tree numbers rose from 163,000 to 693,000 or from 6.5% to 18.2% of the state total. Together with the Mersey the north had almost 23% of bearing

trees in 1922 (Fig. 5). In contrast the Derwent Valley and south-east where planting had ended earlier, there had been a heavy relative decline from 32.5% to 24% (Fig. 5). The southern group of producers experienced less marked changes. The Huon Valley suffered a slight relative decline from 38% to 35%, though tree numbers increased heavily from 971,000 to 1,320,000. It is highly significant that although the Huon Valley only possessed 35% of the bearing apple trees, it was producing over 50% of the apple crop. The D'Entrecasteaux Channel and Tasman Peninsula - Triabunna regions showed slight increases from 9% to 10% and 3.3% to 3.7% respectively. (Fig. 5).

The distribution of pear trees showed similar regional trends in this period. In 1915 the numbers and production were concentrated in the south and south-east, the Derwent Valley and south-east having 35.3% of pear trees, the Huon Valley, 30.8% and the D'Entrecasteaux Channel a further 9%. By 1922 the total numbers of pear trees bearing had more than doubled from 137,000 to 284,000. The majority of the new trees were on the Tamar (chiefly the West Tamar) where numbers of bearing trees increased from 8,000 to 107,000 so to emerge as the leading region with 38% of the total. The Huon and the south-east which had experienced only small plantings declined heavily to 19% and 19.6% respectively.

IV THE PERIOD OF RATIONALISATION.

When conditions returned to normal after the war it was soon apparent that a changing pattern of production and marketing was inevitable. The economic factors of expanding markets which had caused the industry and new plantings to boom until 1915 changed to ones of market pressure. Competition

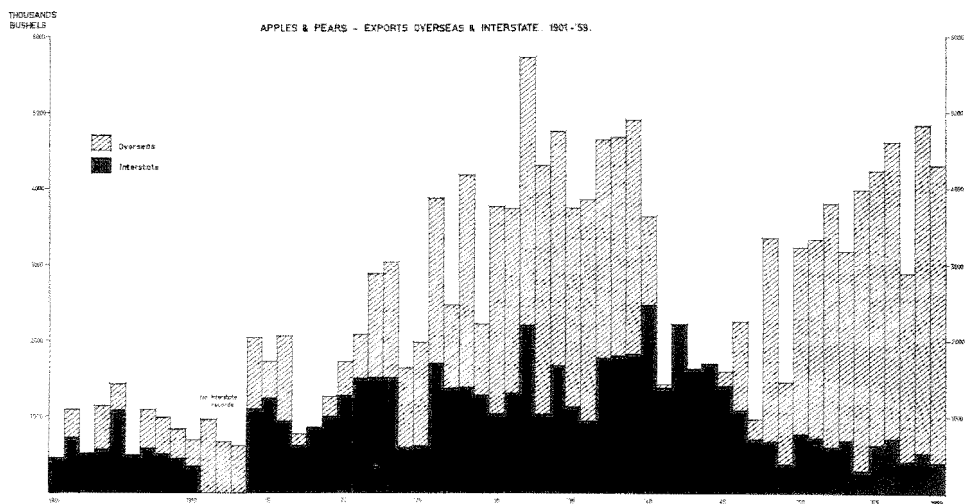
from other southern hemisphere producers and the introduction of a regulated trade pattern after 1934, necessitated even greater specialisation. Increasing government control was introduced in an effort to improve standards of production and presentation of export fruit. These trends expressed themselves in improved cultural practices and in the modification of the regional pattern of production, with the decline and elimination of sub-marginal and low yielding orchards.

1. The Changing Pattern of Trade.

i) The period 1919-34.

In the early 1920's exports overseas increased rapidly with good prices realised on the United Kingdom market in 1923, '24 and '25. Production rose, especially in the north, as new plantings came into full bearing. The construction of a deep water port at Beauty Point on the Tamar provided an export outlet for the northern growers. Overseas shipments were encouraged by a Commonwealth guarantee of £1 per case, the overseas trade was very remunerative and generally prospects were bright. Shipments overseas totalled more than 1,000,000 cases annually from 1922 to 1925 and total exports reached 3,000,000 cases in 1923. (Fig. 6).

But this period of post-war prosperity was to be shortlived and subsequent events were to have profound consequences for the Tasmanian orchardists. The British General Strike of 1926 which disrupted imports of Tasmanian fruit and caused prices to fall ushered in this period of economic change. This blow was closely followed in 1929 by the general depression in world trade which further depressed prices. Yet another adverse factor was the growing competition experienced in the European market from North American fruit kept in cool store, and from other southern hemisphere producers, South Africa, New Zealand and Argentina.



ii) The end of Free Trade, 1934.

The depressed state of trade between Britain and the Commonwealth countries reached a crisis in 1932 and led to the calling of the Ottawa Conference. Here it was agreed that Commonwealth apple exports should be protected on the British market by a tariff of 4/6d. per hundred weight or 1/7d. per case. This had the effect of reducing North American supplies by 75% and completely cutting off European supplies. On the strength of this guarantee, following a good fruit crop in Australia in 1934, 6,000,000 cases of apples and pears were shipped to Britain, 3,000,000 of them from Tasmania. The outcome was disastrous, for the market was flooded with fruit and the prices realised in many cases would not cover the cost of transport. Furthermore in the same year, Hitler's policy of national self-sufficiency caused German apple imports to be drastically reduced. For instance, the port of Hamburg imported 890,000 bushels in 1934 but only 204,000 bushels in the following year.

The lesson of 1934 necessitated the introduction of a system of voluntary restriction of Australian apple and pear exports. An Australian Apple and Pear Board was set up to administer a scheme whereby the export season was strictly limited and each state was allotted a quota. Under this system conditions slowly improved until 1939 and the outbreak of the second world war.

iii) War-time conditions, 1940-49.

The second world war closed the United Kingdom and European markets completely to Tasmanian fruit from 1941 to 1945. Throughout the period under National Security Regulations a Commonwealth Fruit Acquisition Scheme was organised and administered by the Australian Apple and Pear Marketing Board. The purpose of this scheme was, "To minimise the disorganisation in marketing of apples and pears likely to result from the impracticability of exporting sufficient

apples and pears because of the effects on shipping." Under the scheme the Board collected that part of the crop required to satisfy local demands and left the remaining fruit unpicked, compensating the growers on an assessed crop. Tasmania, which had since the 1920's become largely dependent on overseas markets and with no home market to fall back on, was worst affected of the Australian states and her orcharding industry was badly disrupted. Even though interstate shipments maintained a high level and the large scale processing of apples was developed, approximately 50% of the annual apple crop and 65% of the pear crop had to be left to rot on the trees. (Fig 16).

The Fruit Acquisition Scheme continued on after the war, lasting until the 1948/49 season when trade conditions were more normal. Immediately the war ended, overseas shipments were resumed on a small scale to the United Kingdom and Scandinavia. Many difficulties had to be faced in the early post war years. As in the period 1918 to 1922, shipping space was extremely scarce due to war time losses, for instance in 1947 only 255,952 cases of apples could be sent overseas. Case material was in short supply and skilled orchard hands hard to obtain. Consequently for the first few post war years trade was conducted exclusively on a government to government basis using a fixed quota system of exports.

2. The Extension of Government Control over the Orcharding Industry.

The increase in government influence over the orchard industry, exercised by means of regulatory acts, advisory and research services, was to result in even greater specialisation of the commercial holding. The Apple and Pear Standardisation Act of 1919 was the first of a number of regulations to improve the varied standards of overseas fruit shipment. This act was designed to standardise packing and grades of fruit, to introduce branding of cases and was administered by a team of inspectors empowered to stop the export of unsatisfactorily

presented fruit. In 1934 further legislation was introduced to achieve even higher standards of colour grading for the overseas market. The power granted to the State Department of Agriculture in 1935 to carry out the inspection of neglected and pest infested orchards and to destroy these below a minimum standard, sealed the fate of many sub-marginal commercial orchards. Between 1935 and 1939, no less than 2,312 acres of poor and neglected orchards were grubbed out and destroyed.¹⁰⁴

State guidance through the services of the Department of Agriculture were perhaps equally important in improving standards of commercial orcharding. After 1919 through demonstrations in improved cultural practices and fruit presentation, research, particularly in the spheres of pest control, educational publications and in advertising overseas, the government was largely instrumental in affecting major changes in the techniques of commercial orcharding. The net effort of these measures was to bring about even greater orchard specialisation, improved standards and higher yields. Apple and pear production was only profitable, and indeed only permissible, on high yielding and efficiently managed orchards.

3. Improvements in Orchard Cultural Practices.

Economic factors and government control together forced the commercial orchardist to increasingly specialise. As the market difficulties increased and the whole cost structure rose, only by improving his efficiency could the orchardist survive. Cultural practices were improved and became standardised throughout the state. For example, in 1933 the Department of Agriculture stated that, "never before . . . has three successive good yields been harvested comprising such even good quality crops and it is evident that the closer

104 Ibid, 1935 to 1939.

attention given to the scientific aspects of pruning, manuring and pest control has had its effect."¹⁰⁵

Apple varieties were greatly reduced in numbers to achieve more standardisation. While many of the older varieties, such as the French Crab, Ribstone Pippin, Alexander, King Pippin, Aromatic, Crows Eggs and Scarlet Pearmain, unwanted on the overseas markets, were converted to newer varieties, for instance, Delicious, Granny Smith, Jonathon, Crofton and Cox's Orange Pippin.

Stringent export regulations necessitated the grower investing large sums in packing sheds and cool stores, either individually or as a member of a co-operative organisation. These and many other factors of specialisation were only within the scope of the full-time commercial grower operating a high yielding orchard.

4. The Changing Pattern of Distribution.

1) Declining acreages, 1922.-

From the 1922 peak in bearing acreage and apple tree numbers there was a steady overall decline throughout the 1920's and 1930's, falling from 26,760 acres and 3,780,000 trees in 1922 to 21,459 acres and 3,105,000 trees in 1939. This was a period of adjustment to environmental and economic conditions, an adjustment, however, that did not effect all the producing regions equally.

In contrast to declining apple acreages, pears maintained a relatively stable figure of some 2,000 acres, with even a slight increase in planting in the 1930's. This resulted in a peak acreage of 2,676 in 1941. There were also increased plantings of apple trees in this period. The numbers of non-bearing trees rose by 140,000 in 1932 to 402,000 and reached a peak of 480,000 in 1935. The majority

¹⁰⁵ Tasmanian Department of Agriculture, Annual Report, 1931 - 32, p. 18.

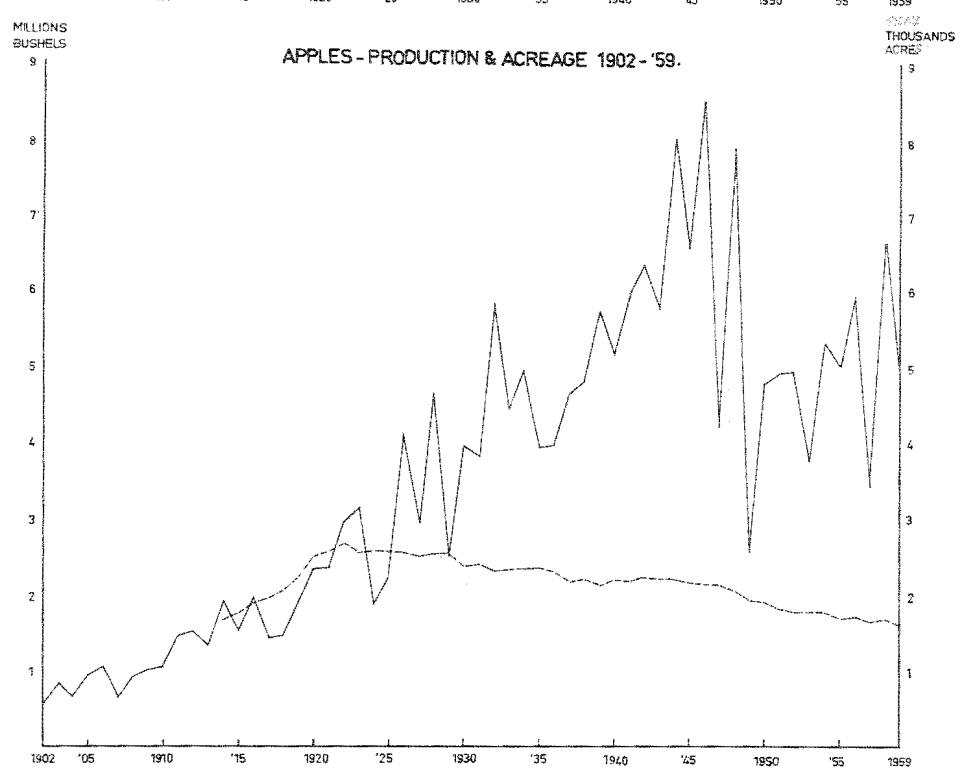
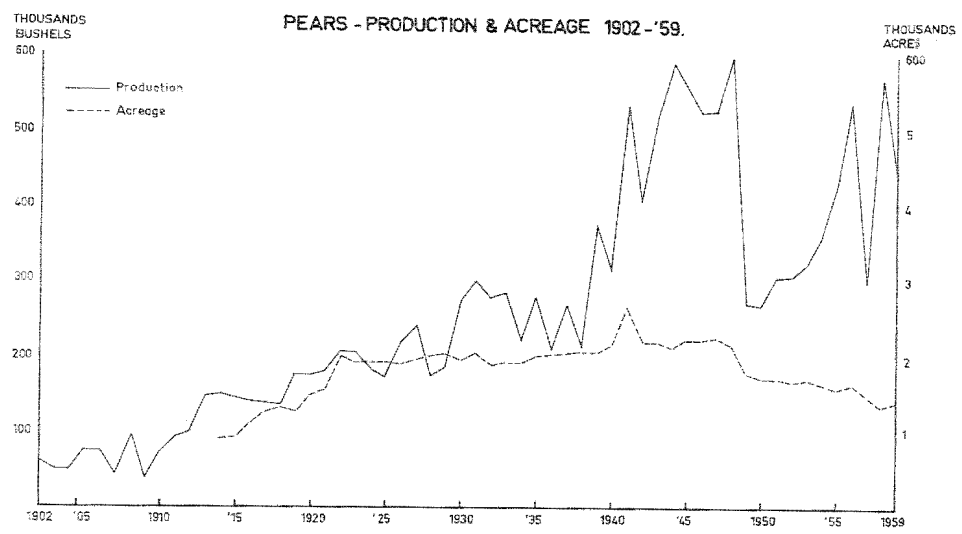


Fig. 7.

of these new plantings were in the south, 380,000 in all, some 276,000 of them in the Huon Valley. However, this minor planting boom was shortlived and the new acreages in the south were more than offset by losses in other areas.

During the second world war this decline was temporarily arrested by orchardists maintaining existing acreages in order to obtain maximum compensatory payments from the Commonwealth Government. However, little new planting was possible, or for that matter the replacement of old trees. Many orchards suffered from neglect due to shortages of labour, materials and capital. In the post-war period there has inevitably been a sharp drop in acreage with many of the neglected orchards removed. With the return of pre-war economic trends, the decline has even been accelerated with both apples and pears affected. (Fig. 7).

ii) The regional pattern.

The Derwent and south-eastern districts suffered the sharpest drop in the numbers of bearing apple trees. In 1922 over 900,000 trees - 24% of the state total - were in this region, in 1949 the figures were 181,000 and 6.3%. The reason for this remarkable decline appears to have been twofold. The low annual rainfall proved to be insufficient for the high regular yields necessary for successful commercial production. In addition, traditionally in the south-east orchards had remained part of a mixed farm economy. With increasing competition and rising costs of production, it was natural for farmers to turn to other more profitable types of farming with a lower cost structure.

The Tamar region similarly experienced a large fall in tree numbers. In 1922 the Tamar had 693,000 bearing apple trees or 18.2% of the state total, in 1949 the percentage had fallen to 14.2% and tree numbers to 406,000, with the heaviest decline in the West Tamar. The factors behind the decline

were in the main historical, arising out of the conditions in the planting boom. Orchards planted on unsuitable soils, exposed sites or with poor rootstocks were never more than sub-marginal and had eventually to be removed. Pear trees likewise suffered an absolute and relative decline, though not as great as for apples. In 1922 the Tamar had 107,209 and 38% of the bearing pear trees, in 1949 only 78,000 or 27.5%.

In contrast to the decline in the other two major producing regions, the Huon Valley showed an appreciable increase in numbers of apple and pear trees. The 1922 figure of 1,320,000 or 35% had risen to 1,690,000 and 58.3% of the total apple trees in 1949, thus emphasising the Huon's leading role. The healthy state of the Huon orchards is ample evidence of the highly favourable environment and the high degree of specialisation achieved on the small, monocultural holdings. With a slight expansion taking place in the other southern regions of the D'Entrecasteaux Channel and the Tasman Peninsula, the south accounted for 75% of the apple and 44% of the pear trees in 1949.

5. The Marketing Pattern, 1922 - 1940.

In spite of violent trade fluctuations, political barriers and increasing market competition in this inter-war period, Tasmanian overseas fruit exports rose to average 3,000,000 bushels annually throughout the 1930's. The bulk of the apples and all the pears went to the United Kingdom, the remainder going to the European continent or in small irregular shipments to Asia. For example, in 1938 the United Kingdom took 2,541,348 cases of apples and 100,321 cases of pears, the European continent 256,000 cases of apples and Asia 56,000 cases.

The role of the interstate market in this period was to absorb the surplus of large crops after the overseas market had been supplied. A most significant development was the

overwhelming importance which became attached to the overseas trade in comparison to the rather lowly status of the once leading market outlets on the Australian mainland. Total exports interstate fluctuated widely, (Fig. 6) in poor seasons the market was under-supplied, in good ones gluts occurred and at all times it received mainly second grade fruit left over from overseas shipments.

Pears entered into the overseas market after the end of the first world war. Up to that time pear shipments were confined to the interstate markets because of poor keeping qualities and proneness to bruising. Some small lots had been shipped to Britain in the early years but these had arrived in poor condition. But improved methods of packing, storage and refrigeration made a steady expansion of overseas pear shipments possible.

SECTION B.

THE PRESENT

ORCHARDING PATTERN

I THE ENVIRONMENT

Tasmania has a humid cooltemperate and insular climate (in Köppens classification C_fb₁, mean annual temperatures exceed 50°F with an evenly distributed rainfall). The island lies on the boundary of the regions of winter rainfall and rainfall in all seasons. The north experiences slightly warmer conditions and a winter rainfall maximum, while the south has somewhat cooler more humid conditions with an even rainfall distribution. Agricultural pursuits are limited by physical conditions to the eastern side of the island. The west has rugged and mountainous relief, poor acid soils, low temperatures and high rainfall totals. The pome fruit orchards lie within this eastern zone of permissive physical conditions where most phases of climate favour deciduous fruit culture - though local variations of climate, soils, slope and elevation impose further restrictions on location. Characteristically the orchards have a coastal or estuarine location - no commercial orchard is more than a few miles from the sea - for here growing conditions are most favourable.

Of the physical factors limiting the spacial distribution of commercial pome fruit orchards, climatic conditions are the most critical. Important though such factors as soil, slope and accessibility are, it is growing conditions which ultimately determine the pattern of distribution and the eventual quality of the crop. But even favourable mean conditions may not be sufficient for, "it is often the extremes and accidents rather than the climatic means which act as controlling agents".¹ However, physical factors have never been over-riding in Tasmania - potential orchard sites far outnumber

1 Balchin, W.G.V., 'Research in Geography', London, 1955, p. 11.

those that have actually been planted, even within the regions of most intensive production. Indeed large areas of commercial plantings were made in locations unsuited to efficient orchard production. There has consequently been adjustment to environmental conditions, with the orchard regions most prone to unfavourable climatic conditions being eliminated as least efficient in terms of costs of production.

1. The Influence of Climatic Conditions on Orchard Production.

i) Temperature conditions.

Temperature is perhaps the most critical of the physical factors restricting the areal distribution of commercial orcharding.² Other environmental factors can be modified quite extensively by artificial means, for instance, rainfall by irrigation, winds by shelter belts, pests and diseases can be effectively controlled by chemical sprays, while soils can be improved by cultivation, drainage and fertilisation. Fortunately mean temperature conditions are very favourable in Tasmania for the production of deciduous fruits with a yearly mean of 54°F ranging between 60°F in February and 46°F in July.³ Summer temperatures are rather higher in the north, particularly in inland locations. On the Tamar, Launceston has a mean average of 64.7°F in February

2 The basic requirements are, 140 - 150 frost free days, winter temperatures not below -35°F (or permanent frost damage results), a winter dormancy period of 900 - 1,000 hours below 45°F, moderate summer temperatures (55°F - 75°F) without excessive humidity to encourage incubation of orchard pests and diseases. Apple trees function most effectively at temperatures of 65°F - 75°F, pears at 75°F - 80°F, 'Elgin, a Deciduous Fruit Growing Area of South Africa', note in Geographical Review, Vol. 40, No. 2, 1950, p. 328.

3 Figures for Hobart.

while Low Head at the seaward end of the estuary is cooler with a mean of 62.1°F . In the south the Huon Valley has distinctly cooler summer conditions, Hythe for example in the extreme south, has a February mean of 58.6°F .⁴

The northern areas in general have a warmer growing season but not a longer one and possibly growing conditions are most favourable of all. Certainly fruit crops fluctuate less than in the south where yields regularly see saw. (Fig.13). The pome fruits also mature earlier in the north, with harvesting beginning from ten to fourteen days before the south - the orchards of the south Huon are latest of all. Orchards with an inland location or planted at higher altitudes are likewise later in maturing than those with a coastal location.

The most favourable temperature conditions for pears are in the warmer and sunnier north and south-east. Nevertheless pears are grown throughout the entire fruit growing areas and there is no appreciable drop in yields in the cooler areas, as for instance the south Huon.

From October to November the orchardist is especially watchful of weather conditions, for a radiation frost or a period of cool, wet weather can greatly reduce the set of fruit. The late summer and early autumn months is another anxious period when long hours of warm, sunny weather are necessary for maturing and colouring the fruit. It is significant that the incidence of unfavourable conditions is most frequent in the south, though departures from the mean are rarely disastrous.

Apart from the occasional seasonal fluctuations, temperature conditions are suitable for the majority of the apple varieties. Notable exceptions are the much favoured

4 Thornthwaite's classification places the north in the warm B¹ group and the south in the cool C group.

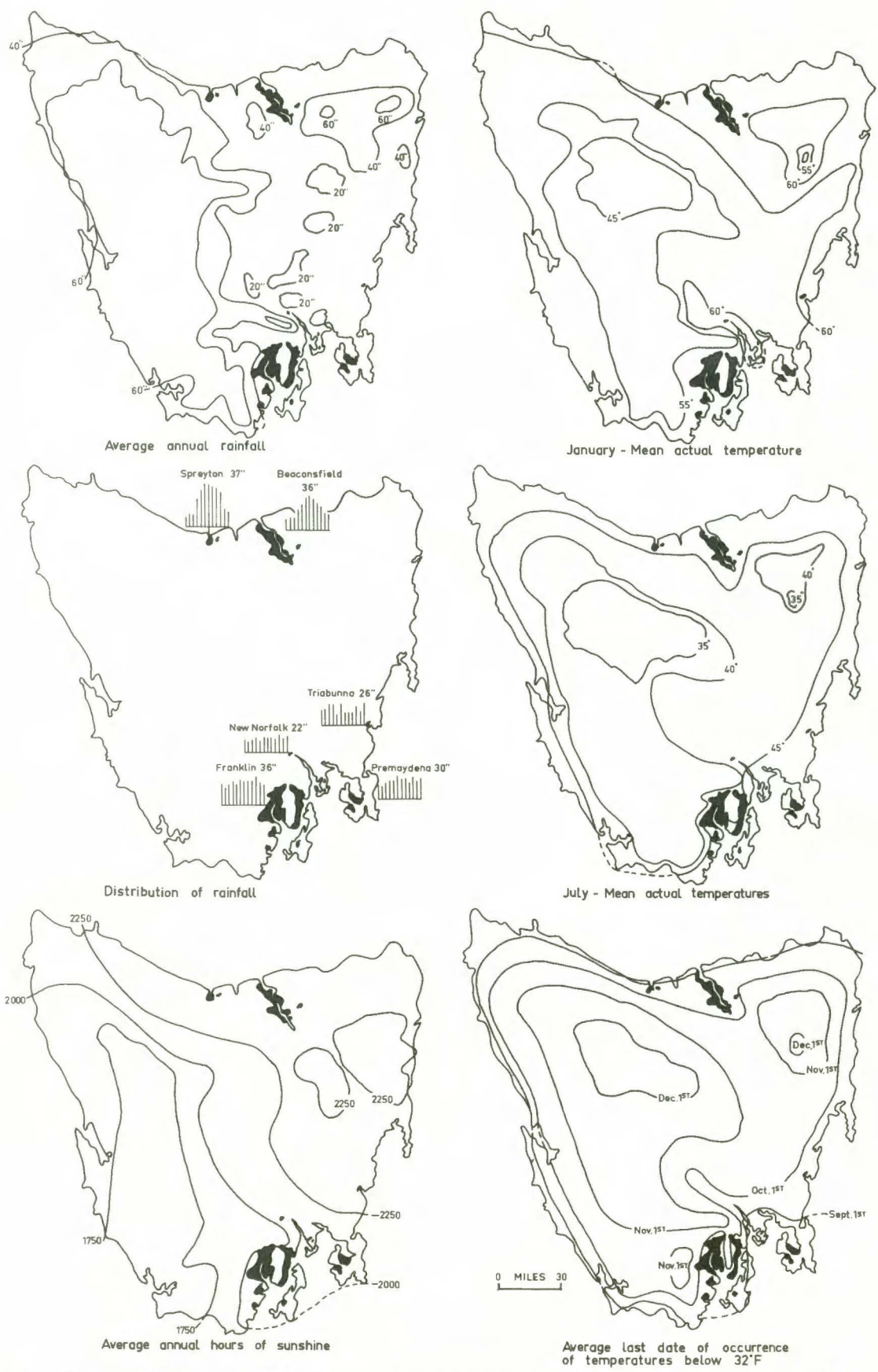


Fig. B. Mean Climatic Conditions and Orchard Location.

British variety, the Cox's Orange Pippin, which rather inexplicably does not grow well under Tasmanian conditions and the Granny Smith variety which attains higher quality and flavour in the warmer growing conditions of Victoria and New South Wales.

ii) Rainfall.

The major regions of pome fruit orcharding are in areas receiving an annual rainfall of 30 to 40 inches,⁵ near optimum amounts when rainfall is normal.⁶ (Fig. 8). The notable exceptions are in the mid and lower Derwent Valley and at Triabunna where annual rainfall totals are less than 25 inches.⁷ Here rainfall is insufficient in most years and significantly these are areas of low yielding orchards of declining importance (except where orchards can be irrigated). Under Tasmanian conditions the upper rainfall limit is in the vicinity of 40 to 45 inches.⁸ With higher totals, problems of drainage, excessive tree growth, high humidity and the

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- 5 According to Thornthwaite's classification the Humid B grouping - precipitation efficiencies range between 70 and 80, for example Beaconsfield (Tamar) P.E.75, Spreyton (Mersey) P.E.73, Franklin (Huon) P.E.71, Hythe (South Huon) P.E.81.
- 6 Apple trees need to absorb approximately 11 inches of rain per year to produce a good crop of 400 bushels per acre. Assuming an average loss of two-thirds of the annual precipitation through run-off, seepage and evaporation, an annual rainfall of more than 30 inches is necessary to produce a good commercial crop - Gardner, V.R., Bradford, F. C. and Hooker, H.D., 'Orcharding', New York, 1927, p. 35.
- 7 The Derwent Valley and south-east are of the moister sub-humid C4 type with a P.E. of 40 to 60, for instance New Norfolk (Derwent) P.E.48, Sandford (South-East) P.E.43, Triabunna (East Coast) P.E.49.
- 8 In the opinion of Mr. C.P. Fleming, Senior Horticultural Officer, Tasmanian Department of Agriculture.

associated increase in orchard pests, makes orcharding an uneconomic venture.

Sufficient total precipitation alone does not ensure regular cropping and seasonal distribution is of considerable importance. The Tamar and Mersey Valleys with a winter maximum (Fig. 8) most nearly match the optimum distribution. Heavy winter rains⁹ are followed by good spring falls but with intermittent dry periods which facilitate spraying. The early summer falls are sufficient to size the fruit and the dry late summer is ideal for ripening and harvesting. The southern districts with an even distribution (Table 11) suffer particularly from the disadvantage of a wet spring - October is the wettest month of the year at many stations (Fig. 8). In some years prolonged rainy periods in spring reduce the set of fruit, increase the incidence of pests and hinder spraying operations.¹⁰ The apparent advantage held by the north is somewhat offset by greater variability of rainfall, particularly on the West Tamar where the mean deviation is more than 20%.¹¹ In 1949/50 for example, the rainfall for the crop year (June to June) was 22.24", in 1955/56, 67.42", against a mean of 36.17".

Summer droughts produce the most obvious adverse effects on the pome fruit crop,¹² for instance in 1960 the apple crop was reduced by an estimated one million bushels in

9 Northern Tasmania is on the boundary of summer drought conditions under Köppens classification (Csb.).

10 Between 1946 and 1960 on five occasions, 1946, 1948, 1952, 1956 and 1958.

11 Scott, P., 'Variability of Annual Rainfall in Tasmania', Papers and Proceedings of the Royal Society of Tasmania, Vol. 90, 1956, p. 50.

12 Between 1946 and 1960 drought conditions have occurred in four years, 1950, 1955, 1957 and 1960.

a late summer drought. Under such conditions the fruit fails to attain full size and natural colour at maturity and lacks quality with respect to flavour and juice content. In an effort to allow the fruit to reach full size, growers tend to delay picking until the fruit is over mature with a consequential decline in quality for overseas export. Although the orchard practice of clean summer cultivation greatly assists in the conservation of soil moisture, it is increasingly evident that irrigation is necessary in all areas when a dry summer occurs. The need for crops of regular size and quality has prompted many growers to install irrigation facilities over the last decade.

Table 11 Rainfall Distribution - Sample Stations.
(monthly and seasonal).

Station	Jan.	Feb.	Mar.	Apr.	May	Jne.	Jly.	Aug.	Spt.	Oct.	Nov.	Dec.	Year	Oct.- Mar. %	Apr.- Spt. %
Beaconsfield (Tamar)	154 7	177 6	187 7	287 10	343 11	449 13	456 15	412 15	358 14	320 12	223 10	243 10	36.09 130	35.3	64.7
Spreyton (Mersey)	130	177	159	370	397	473	487	442	409	367	222	202	37.29	33.6	66.4
Franklin (Huon)	266 12	211 9	262 12	312 13	275 13	330 14	329 16	319 16	331 17	368 17	317 15	297 12	36.17 166	47.5	52.5

Source. Commonwealth Bureau of Meteorology, Book of Normals - No. 1. Rainfall.

iii) Hail.

Hail is the climate hazard most feared by Tasmanian fruit growers. No other climatic element is so unpredictable in incidence or strikes so dramatically and disastrously. In some instances a storm lasting a few minutes will destroy an entire crop.

Total losses from hail damage fluctuate greatly

from year to year, the average being 500,000 bushels or 10% of the total apple crop (Table 12). However, in the seasons of 1955/56 and 1959/60 almost 2,000,000 bushels of apples suffered hail damage and a single storm in December 1959 affected an estimated 1,500,000 bushels. The damage caused by individual hail storms varies enormously, from a few bushels in a single orchard, to one million bushels over a major fruit growing district. For example the Castle Forbes Bay area in the mid Huon Valley, which after a severe hail storm in December 1959, harvested only a few hundred bushels of apples instead of the usual 250,000 to 300,000 bushels.

Table 12. Hail Damage 1949-56. (Apples and Pears).

Year	Amount in bushels	% of total crop	Insured value	Number of claims
1949/50	423,700	7.8	£62,961	322
1950/51	217,216	4.1	£27,152	137
1951/52	406,224	7.3	£57,780	338
1952/53	385,688	8.9	£48,211	218
1953/54	396,840	6.6	£49,605	-
1954/55	134,342	2.3	£16,790	-
1955/56	1,854,720	21.9	£231,840	900

Source - Tasmanian Government Insurance Office.

The cumulo-nimbus clouds containing hail originate in two types of weather patterns; in spring, when a succession of scattered storms in a cold front follow the passage of a low pressure system and in summer from local convectional storms. Generally storms are local in incidence¹³ and occur

13 Only a small part of the storm may contain hail.

most frequently in narrow strips, varying from a few yards up to two to three miles wide. The severity of damage depends on the duration of the storm and the size and shape of the hail stones. In small local storms of short duration, the fruit may only suffer slight bruising or pitting of the skin which if it happens early in the year, may grow out. Moreover, slightly damaged fruit can be used for factory processing, however, even a small percentage of damaged fruit increases the labour and costs of sorting and grading the affected fruit. The most serious damage of all occurs when the hailstones are large (up to $1\frac{1}{2}$ inches in diameter), jagged and driven by strong winds. In such cases the fruit is deeply scoured, gouged and knocked off the trees with 100% losses of export fruit. In addition foliage is stripped from the trees, the bark pierced and even limbs broken off. Long term injury may also result from the destruction of the following season's fruit buds so upsetting the bearing rhythm for many years. Storms of this magnitude are fortunately rare. Between 1948 and 1960 there have been six causing damage ranging from 100,000 to 1,500,000 bushels.¹⁴

The incidence of hail in Tasmania is most frequent in the period from July to December when the weather pattern is commonly an unstable one. The incidence of damage to pome fruit orchards is consequently most likely from October to December, though injury is possible throughout the growing season from early October to late May. (Table 13). November

14 7th November 1948 mid Huon 1,000,000 bushels, 24th February 1951 Tamar 100,000 bushels, 26th February 1953 Huonville and North-West Bay 130,000 bushels, 30th December 1955 mid Huon 250,000 bushels, 10th January 1956 mid Huon 200,000 bushels, 10th December 1959 mid Huon 1,500,000 bushels.

has the highest frequency of storms (Table 13), but December's losses are much greater since the maturing fruit stand less chance of recovery. After December the risk of hail damage becomes increasingly less, but spasmodic local storms of great severity occur as late as May. (Table 13). For example on the 26th February, 1953, a severe storm with hail and gale force winds swept across Huonville, Margate and South Arm leaving a trail of destruction in its wake. Between 90,000 and 100,000 bushels of apples were ruined at Huonville alone.¹⁵

Table 13. Monthly Incidence of Storms Causing Hail Damage - Totals, 1948-60.

Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May
3	27	24	6	4	-	2	1

Source - Newspaper reports and information supplied by the Tasmanian Government Insurance Office.

The distribution pattern of hail storms can only be assessed in terms of damage done to orchards and although the Huon Valley suffers most frequently, (Table 14) this is almost certainly attributable to the fact that it is the area with the greatest intensity of production. Indeed there is no real evidence that any particular site or district is immune to damage. One characteristic feature does appear in that storms invariably come from a north-westerly direction, sweeping across the fruit districts from west to east. In the Huon Valley storms commonly move south-east along the line of the estuary and similarly on the Tamar. It seems likely that local relief is of some influence on storm tracks as indicated by the frequency with which storms follow the line of major valleys.¹⁶ In the minds of many growers, the

15 "The Mercury", 25th February, 1953.

16 Some orchardists hold the opinion that the worst hail damage occurs in orchards sited on the fringing slopes of the main valleys.

mid Huon area, which has been badly hit on a number of occasions in recent years (some orchards at Glen Huon, Franklin, Castle Forbes Bay and Geeveston have suffered heavily in five years between 1952 and 1960) is in a storm track or hail belt. This opinion has expressed itself in a decline in value of some of the worst affected properties.¹⁷

Table 14. Monthly Incidence of Hail Damage, by Regions, 1948-60.

Region	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	Total
Tasman Peninsula	2	4	2					1	9
D'Entrecasteaux Channel		6	3		2			1	12
Derwent Valley		1	4						5
West Tamar	1	4	9				1		15
East Tamar		2		1					3
Mersey Valley		2		1					3
Huon Valley	1	11	7	3	2		1		25

Source - Ibid.

Although Tasmanian authorities have shown interest in artificial measures for preventing hail damage, as yet

17 There is little doubt that growers have become increasingly hail conscious since the introduction of a compulsory insurance scheme in 1949. For instance, at a meeting of growers in 1946 to discuss proposals for such a scheme it was generally claimed that hail was so rare as to be unnecessary to insure against damage. "The Mercury", 7th December, 1946.

lack of knowledge of storm behaviour and patterns, together with the supposed high costs of installation and maintenance has precluded their introduction.¹⁸

iv) Frosts.

Spring frosts, a major climatic hazard in so many of the apple growing regions of the world, are not a really significant factor in Tasmania and as such have not been given much attention in the selection of orchard sites, (many Tasmanian orchards are poorly sited on British standards). When frost damage does occur it is usually on a local scale only. Susceptibility to frost is largely a question of situation, for the districts most affected are the mid Derwent Valley, Glengarry and Sidmouth on the West Tamar and the upper Huon and Mountain River Valleys - all are characterised by a sheltered inland location. Elsewhere location near a large waterbody and on sloping sites provides almost complete freedom from frosts. On the rare occasions that damage does occur it is significantly most severe in orchards planted on the river flats.

At Glengarry and Sidmouth the incidence of frost damage to pears is frequent enough to necessitate artificial methods of prevention. Smudge pots¹⁹ have been installed and are regularly in use two or three times a year in the critical blossoming and setting periods. The frost risk at Sidmouth is increased by a belt of woodland blocking the lower end of a shallow valley so impeding katabatic air drainage

18 Experiments with hail rockets are to be made by individual growers in the 1960/61 season - significantly in the mid Huon district. Rockets have been used in the apple growing district of Stanthorpe in Queensland for a number of years with success. They are used quite extensively in the grape producing regions of France and Italy.

19 Early in the century some growers in these areas set fire to the surrounding woodland when a bad frost threatened.

Table 15. Recordings of Frost Damage to Fruit Trees
1919-59 (by regions).

Region	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apl.	May	Total
Derwent Valley	3	6	5	1	1					16
Tamar Valley		5			2				1	8
Huon Valley		4	1						1	6
Tasman Peninsula	1		1							2
D'Entrecasteaux Channel	1									1
Mersey Valley			1							1

Source. Foley, J.C., op. cit., and newspaper reports 1946-59.

Table 16. Average Number of Days Below 32°F (10 year
recordings 1930-40).

Region	Jan.	Feb.	Mar.	Apl.	May	Jne.	Jly.	Aug.	Spt.	Oct.	Nov.	Dec.	Yr.	Av.No. Frost free days 32°F.	Av.No. of days 36°F.
Derwent (Bushy Park)				0.8 29	3.0	8.9	7.8	5.5	2.4 30	0.6			29.0	210	126
Tamar (Laun- ceston)			0.1	0.4	1.2 9	6.7	4.9	4.2	1.2 16	0.3			19.0	234	173
Huon (Hythe)				0.1	1.4 27	2.5	3.0	1.4	1.3 7	0.3			10.0	263	191

Source. Ibid.

down the valley and creating a local frost hollow.

Radiation frosts mainly occur when an anticyclone is centred over the Australian Bight, the Eastern States and Bass Strait, fortunately such a weather pattern is normally of short duration. The greatest danger extends from the time the pear blossom appears in mid September, until after the apple crop has set early in November.²⁰ However, severe frost damage has occurred in the Derwent and Tamar Valleys as late as January 27th²¹ (Table 15) even though the average frost free period is more than 200 days. (Fig. 8). Early autumn frosts in May have caused losses of ripening apples, for example in 1950 in the Tamar Valley and in 1958 in the Huon Valley (Table 15) but this is a rarity.

General frost damage over a whole orchard district is a rare occurrence and since 1946 there have been only three instances, October 24th - 27th, 1946 on the Tamar when 3°F of frost caused fruit to go black and pulpy and some growers had 100% losses,²² October 23rd, 1954, again on the Tamar²³ and on the 20th November, 1957, when severe frosts, the latest known in the Huon Valley, caused up to 70% losses at Cygnet, Glen Huon, Grove, Ranelagh and Huonville.²⁴

v) Aspect.

The most widely planted slopes are those facing north and east. Such slopes receive maximum insolation,

20 Damage varies with the stage of development reached by the crop, the critical temperatures below which frost damage occurs are; in bud 25°F, full flower 28°F, small fruit 29°F and in fruit 30°F.

21 Foley, J.C., 'Frosts in the Australian Region', C.S.I.R.O., Bulletin No. 32, Melbourne, 1945.

22 "The Examiner", 29th October, 1946.

23 "The Examiner", 25th October, 1954.

24 "The Mercury", 27th November, 1957.

are open to ameliorating marine influences and are sheltered from cool, wet and windy weather associated with westerly air streams. However, there is little evidence that yields on slopes with southerly or westerly aspects are lower, and in respect to one climatic hazard, sunscald, such an aspect is an advantage. Aspect is of major importance in site location only in the narrow headwater valleys in the south where plantings are almost entirely confined to northerly or easterly facing slopes. (Fig. 15).

vi) Insolation.

The optimum of 2,000 hours of sunshine or more is normally adequately fulfilled under Tasmanian conditions. The northern districts have a decided advantage in this respect with considerably higher annual totals, for example Launceston has an average of 2,437 hours, Hobart 2,143 hours. (Fig. 8). Also a higher percentage of the northern total occurs in the growing season (October to May) - Launceston 75%, Hobart 72% - so that in general the red varieties of apples colour better in the north.

A lack of spring sunshine hinders pollination and a summer deficiency results in poor colouring of the red varieties²⁵ with the southern growers experiencing the most frequent trouble. Conversely extreme January heat with temperatures over 100°F in conjunction with humid conditions causes damage to fruit through sunscald or heatspot. The northerly facing slopes on the Huon and Derwent Valleys suffer the greatest losses, where for instance in January 1959, 250,000 bushels of apples were affected.

25 There is strong evidence that the flavour, colour and keeping qualities of Tasmanian fruit vary quite widely from season to season in relation to the seasonal growing conditions of which sunshine is an important factor.

vii) Wind.

In general Tasmanian orchards have been planted on sites well protected by natural shelter provided by enclosed valleys, hills and woodland. Where more exposed sites have been planted, as for instance on spurs or open valley floors, windbreaks of pines or poplars have been established around the orchard blocks. This is especially the case with pear plantations on the Mersey, Tamar and at Triabunna - pears being more prone to windfall when near mature than apples.

During the speculative period of plantings on the Tamar, excessive wind damage from north-easterly winds on sites at the mouth of the estuary caused plantations to be abandoned in the early 1920's. Though actual abandonment due to wind damage is rare, nevertheless the need for a sheltered site is very necessary and it is noticeable that orchards on exposed shoulders and spurs suffer most severe losses from windfall.

Although wind damage does occur throughout the growing season, the most frequent and severe damage takes place in the harvesting period when large quantities of ripening fruit can be blown off the trees, with pears suffering very heavily. For instance in February 1951, a north westerly gale of 70 miles per hour caused the loss of 120,000 bushels of fruit in the upper Huon and Mountain River Valleys.²⁶ Spring gales halt orchard spraying operations, hinder the pollinating activities of bees and when exceptionally severe damage trees.

Table 17. Incidence of Wind Damage to Orchards, 1946 - 59.

Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April
1	3	1	4	4	4	1

Source. Newspaper reports and information supplied by the Commonwealth Bureau of Meteorology, Hobart.

26 "The Mercury", 15th February, 1951.

2. The Influence of Biogeographical Factors.

i) Natural vegetation.

Primarily established in areas receiving an annual rainfall of 30 - 40 inches, Tasmanian orchards occupy sites that were formerly densely wooded with sclerophyll or wet sclerophyll forest of blue gum, stringy bark, swamp gum, gum top and other eucalypts, with an undergrowth of wattle (acacia), heath, tee tree, banksia, casuarina and bracken. Indeed the sites of the early commercial plantings were commonly chosen on the strength of the type of forest cover as an indication of soil fertility. For example the presence of giant gums, ferns and dogwood indicated deep fertile soils on dolerite; the stringy bark grows on less rich soils, the tree height being an indication of soil fertility. Least suitable was land supporting a forest cover of peppermint gums, heath and tee tree. On sour and ill drained soil rushes also appeared.

Though once considered the prime handicap to the pioneer farmer, the remnants of this forest cover have become of some considerable value in the present orchard economy, affording natural shelter, providing rough grazing on uncultivable slopes and producing timber for case making.

ii) Orchard pests and diseases.

Insect pests and fungus diseases are capable of causing serious crop losses on commercial orchards, through surface blemishes or boring through the fruit rendering it unfit for export and by damaging trees and foliage. Since commercial orchards are very intensely concentrated this alone encourages the build up in numbers of harmful pests. The control of orchard pests and fungus disease by chemical sprays is a major cultural operation amounting to some 25%²⁷ of

27 Inglis, I.G. and Fergusson, D.J., 'Production and Presentation Costs of a Sample of Tasmanian Apple Growers 1955 - 56 Season', Bulletin 37, Hobart, January, 1958, p. 10.

production costs, the largest individual item.²⁸ The distribution and degree of concentration of pests and disease is consequently of great significance in orchard location as a physical factor expressed in terms of costs of production. Though distribution is mainly related to climatic conditions, in Tasmania as in other parts of the world where European settlement has taken place, the incidence of orchard pests and disease is the direct result of artificial introduction.

Tasmanian orchards are subject to attacks and infestation from all the major pests, for example codlin moth, woolly aphis, light brown apple moth, European red mite, red spider, mussel scale, etc., while black spot, apple canker, brown rot, powdery mildew, armillaria mellia, bitter pit, etc., are but a few of a host of fungus and virus diseases. Almost all²⁹ were introduced unwittingly by the pioneer settlers early in the nineteenth century on imported seedling fruit trees. In the early stages of development of settlement there was little need for control since orchards were small and widely scattered. However, once commercial orcharding began and large concentrations of plantings were established, pests and diseases built up in numbers to damaging proportions.

Before the advent of spraying in Tasmanian orchards in the late nineteenth century, the depredations of pests did greatly influence orchard location. For example the almost complete destruction of the apple crops by codlin moth between 1860 - 1890 in the then leading orchard districts

28 In addition large sums are spent on research by government and private enterprise.

29 Armillaria mellia, a native root fungus is a major exception.

of Launceston and Hobart, completely re-orientated the orchard industry to the new and non-infested plantations in the Huon Valley. Similarly it was the woolly aphis, a serious pest in the early twentieth century, which necessitated the extensive plantings made in northern Tasmania at that time to be made on the blight proof Northern Spy rootstock. This was an unfortunate choice as was subsequently proved by the small and weak trees produced. Undue haste in planting on the newly cleared land also resulted in infestation with the native root fungus *armillaria mellea*, with a serious loss of young trees in some orchards.³⁰

Though the overall incidence and costs of control are similar throughout the major orchard regions, local climatic conditions do largely determine the degree of infestation. For example, the disease black spot which causes bad blemishes on both apples and pears is most serious when the spring conditions are wet and humid. Control of this disease becomes increasingly difficult in the heavily wooded and higher rainfall areas of the south, such as in the lower Huon Valley. Conversely orchards in the warmer and drier Derwent Valley are less troubled by black spot. In general, pest control is most serious under warm, moist and humid conditions which encourage incubation, while persistent rain delays the application of sprays.³¹

Attempts have been made at biological control to reduce spray costs, though with only minor effect. The ichnumen fly, a parasite of the codlin moth, was for example introduced early in the present century and the aphelinus

30 As high as 8% in some parts of the Tamar - "The Mercury", 13th October, 1960.

31 Black spot infection is most likely if the trees are wet for 12 hours or longer. Annual Report of the Tasmanian Department of Agriculture, 1956-57, p. 42.

mali, a parasite of the woolly aphis was brought into Tasmania from New Zealand³² in 1924.

It would appear from Tasmanian conditions that in the present orcharding regions pest control is a serious but not insuperable problem. However, the planting of higher rainfall areas would be handicapped by the need for increased pest control and although modern sprays would do this, the increased costs would make this physical factor a limiting one.

Meanwhile the position is far from static, each pest appears to achieve a period of prominence as numbers build up above the normal level - at the present time the powdery mildew. A disturbing feature is the emergence of resistant strains, for instance the codlin moth and European red mite. In addition new diseases, particularly minor viruses, are appearing for the first time, for example in 1957 the apple ring spot was first noticed on Granny Smith apple trees.³³ The problem of control of orchard diseases and pests is one requiring constant research and is an essential service in Tasmanian orcharding.

iii) Orchard pollination.

The trend towards making plantings in large blocks of single varieties has caused problems of poor pollination resulting in lower yields. Bees are the chief pollinators and many orchardists now own or hire hives to increase fruit yields. The spring climatic conditions have a direct bearing on production through reduction in the activity of bees and other pollinating insects. A cool, wet and blustery spring retards pollination and causes a poor set of fruit³⁴ while the

32 Where it had also been introduced with some success.

33 Ibid. p. 42.

34 The optimum for pollination and fertilisation is from 70°F-80°F with moderate humidity. Below 40°F there is no bee activity, while pollination and germination at temperatures below 50°F decreases the set of fruit.

use of arsenic sprays has been found to kill bees and other pollinating insects.

iv) Animal pests.

At the time of the early commercial plantings the rabbit was a serious and destructive pest, "In some places there is hardly a tree to be seen which has not been stripped of its bark by these troublesome pests."³⁵ Young plantations had to be surrounded by rabbit proof fencing at considerable cost. However, the effects of myxamatosis and the laying of the poison 1080 has greatly reduced the rabbit population. Where orchards are near or adjacent to woodland the native opossum is a minor pest removing small quantities of fruit.

3. The Factors of Orchard Location.

Since Tasmanian orchards are productive on a variety of soils, drainage situations, varying slopes and elevations, generalisations in distribution are not easy and must contain many exceptions. Moreover the generally permissive climate has lessened the significance of site.³⁶

i) The orchard site.

The major concentrations of pome fruit orchards are situated on sedimentary strata of Permian and Triassic age, consisting chiefly of shales, mudstones and sandstones.

35 "The Tasmanian Agricultural Gazette", Dec., 1901, p. 133.

36 Though the selection of an orchard site needs careful consideration. The life of a commercial orchard is from 40 to 50 years or even more and it is 7 to 8 years before trees reach full bearing. The suitability of other crops can be decided by means of trial and error but commercial orcharding is a long term investment involving large amounts of capital - the first choice must be the right one.

Small amounts of orchard land are on a wide variety of other formations, such as Jurassic dolerite - which has extensively intruded the Permian and Triassic sediments - Tertiary sands, gravels, clays and basalts and on recent deposits. The sedimentary formations have been deeply dissected, particularly in the south, resulting in a varied, often rugged relief with slope the dominant factor limiting agricultural land use. Characteristically orchards occupy gently sloping sites with good natural drainage in coastal, estuarine or valley locations. In the south, orchards extend inland along the valley network of the coastal streams and the pattern of orchard land use corresponds very closely with that of the coastal drainage pattern.

To a considerable degree orchards utilise the gently graded slopes³⁷ afforded by a complex series³⁸ of marine benches, river terraces and at higher levels, erosion surfaces,³⁹ (each succeeding level of increasing altitude is of decreasing importance). The marine benches are of Pleistocene or Recent age and a number of well marked shore line platforms occur, probably to as high as 400 feet above

37 Though orchards also occupy suitable slopes between the various levels.

38 Lack of published information and detailed topographic maps makes overall morphological interpretation difficult.

39 Especially between 300 and 900 feet - termed the lower coastal surface - Davies, J.L., 'High Level Erosion Surfaces and Landscape Development in Tasmania', Australian Geographer, Vol. VII, 1959, pp. 193 - 203.



Photo. 1. Apple orchards on gently sloping benches overlooking a small tributary valley. Geeveston, Huon Valley.



Photo. 2. An isolated orchard holding on an upper bench (600 feet). The surrounding woodland provides natural shelter. Franklin, Huon Valley.

present sea level.⁴⁰ The most extensive plantings are on the lower platforms, especially between approximately 50 and 100 feet, as for example at Margate on North-West Bay. River terraces show considerable local variation in height.⁴¹ Three have been recognised in the Huon Valley, for instance on the Mountain River the highest in the upper reaches at 250 feet but falling uniformly to 80 feet at the estuary.⁴² The shoulders, spurs and plateau remnants of higher erosion surfaces provide suitable though relatively isolated orchard sites. Large plantings have been made on an extensive level at approximately 700 feet at Braeside in the mid-Huon and around 900 feet at Tunnel near Lilydale and at Wattle Grove near Cygnet. Isolated orchards do occur at even greater heights, such as Collinsvale on the lower Derwent at a height of over 1,200 feet.⁴³

Significant acreages of orchard have been planted on alluvial deposits where streams have developed a plains

40 Twidale, C.R., 'A Reconnaissance of the Corinna - Pieman Heads Area - Geomorphology', Papers and Proceedings of the Royal Society of Tasmania, Vol. 91, 1957, pp. 23 - 39.

41 In the Derwent Valley at New Norfolk these occur at 100 to 150 feet, 25 to 60 feet and 5 to 15 feet - Lewis, A.N., 'Correlation of Tasmanian Pleistocene Raised Beaches and River Terraces in Unglaciaded Areas', Papers and Proceedings of the Royal Society of Tasmania, Vol. 75, 1934.

42 Mather, R.P., 'Geology of the Huon District', Papers and Proceedings of the Royal Society of Tasmania, Vol. 89, 1955.

43 Probably on the upper coastal surface of from 1,200 to 1,500 feet, Davies, J.L., op. cit.

tract with an open valley. Such deposits are limited in distribution to the valleys of the major rivers, notably the Derwent - where, however, most of the alluvial flats produce hops - the upper Huon, the lower Mountain River and the Mersey. Narrow alluvial strips which border the coastal streams and small fan like formations where a number of small streams coalesce and debouch onto the narrow coastal plain, provide further alluvial tracts, as for instance at Castle Forbes Bay (Fig. 15) and Flights Bay in the Huon. Streams are entrenched up to 10 feet in these deposits providing freedom from all but the highest floods.

The orchards of the Tamar and Mersey are planted in areas of less rugged relief than those in the south, (Photo. 8) while potential orchard sites are more plentiful. Consequently factors other than slope are of proportionally greater significance. Exceptions are the small and scattered orchard areas around Lilydale where more rugged relief confines agriculture in general and orcharding in particular to pockets of suitable land on the valley slopes of the Piper River and its tributaries.

Comparatively few orchards in either north or south are planted at heights exceeding 400 feet and the majority have sites facing a water frontage below 200 feet. Some apple orchards are planted at greater heights and while the trees grow well on deep soils, they have the handicap of late maturing fruit, greater difficulty of pest control and relative isolation on poor minor roads. The altitudinal limit for commercial orchards in Tasmania is approximately 1,000 feet,⁴⁴ at greater elevations costs of production rise

44 In the opinion of the Senior Horticultural Officer -
Tasmanian Department of Agriculture.

above economic limits.

ii) Soil conditions.

The pome fruits are grown successfully on a wide range of soils, many of indifferent quality and varying in texture from sands, gravels, loams and clays. The major groups of residual soils are derived from mudstones, shales and sandstones of Permian-Triassic age, but small plantings are on soils derived from Jurassic dolerite and Tertiary sediments and basalt. Large acreages also occur on recent fluviatile deposits - terrace gravels and alluvium and even on wind blown sands at South Arm.

Apart from sufficient soil depth, the primary soil requirement regarded by the Tasmanian grower as essential, is a moisture retaining clay subsoil. This opinion, which is in marked contrast to plantings in other parts of the world on free draining subsoils (such as gravel) - as for instance in Nova Scotia - appears to have arisen from the need for adequate moisture supplies in the frequent periods of summer drought.

The pioneer commercial planters in the south held the belief that fruit trees grew best on deep fertile soils and accordingly the first orchards were established on the valley floors. Shortage of valley sites led to later plantings being made on poorer, shallower soils on the valley slopes. As these plantings succeeded subsequently large areas were planted throughout the state with little or no regard to soil conditions. This trend culminated in the hasty speculative orchard plantings on the Tamar and Mersey in many instances on unsuitable soils containing hard pan formations.

With the exception of those of recent origins, the

orchard soils are podsollic,⁴⁵ characterised by deficiencies of humus and organic matter, poor winter drainage and by low inherent fertility. There is a striking uniformity of soil type throughout the various growing areas with most of the major types present in each. The extensive plantings in all areas on the Permian and Triassic sediments are typically on soils with a surface horizon of a sandy-loam texture, ashy-grey or grey-brown in colour, over a subsoil of grey-brown or yellow-grey mottled clay. For example, the Huon soil series,⁴⁶ which consists of a silty loam on the valley floors and terrace areas, a loam on the lower valley sides, passing through a sandy loam to sands of decreasing depth as slope and height increase. These minor locational variations influence tree size and growth. The deeper, darker and more loamy soils which occur on the lower valley sides, due to soil wash down slope, produce trees that are larger and more vigorous than those on the steeper and denuded upper slopes. Though generally of second class quality, the podsoles do have the advantage of producing hardy trees which bear heavily and occupy land which would otherwise give poor returns from general farming.

The major concentrations of orchards on alluvial soils are in the mid Derwent, the upper Huon and lower Mountain River Valleys. These soils are deep, light in texture and well drained, producing trees which are larger and longer living, though frequently at the expense of fruit production.

45 With a pH as low as 3.8 - Ward, J.R., 'Copper Deficiency in Young Apple Trees in Tasmania', The Tasmanian Journal of Agriculture, Vol. 30, No. 4, November 1959, p. 329.

46 As defined by Taylor, J.K., and Stephens, C.G., 'The Apple-Growing Soils of Tasmania', C.S.I.R.O., Bulletin No. 92, 1935.

Soil drainage is perhaps more important than soil texture and fertility in producing healthy orchards. Although under Tasmanian conditions a moisture retaining subsoil has long been thought necessary, of equal significance is adequate soil drainage to prevent water logging and root suffocation, for, "Apple trees will not tolerate wet feet."⁴⁷ In the main, Tasmanian orchards are planted on sloping sites and rely on natural topographic drainage. Only in soils on level sites where natural drainage is weak have artificial pipe drains been used. On free draining soils this system has proved satisfactory but the presence of an impermeable hardpan layer - locally known as 'bar' - has proved troublesome and even fatal to trees.

Hardpan appears in irregular patches, most frequently on the highly leached, shallow, sandy soils of the higher slopes and so impedes drainage as to cause waterlogging after heavy rains. In summer it increases the effects of drought and generally trees are weak and stunted due to restricted root development. For instance, trees planted on hardpan soils over forty years ago on the Tamar and Mersey have remained under three feet in height. On a small scale hardpan has been removed by digging it out or even by the use of explosives. On the Tamar the incidence of impeded drainage has appreciably influenced orchard location, causing complete abandonment of hundreds of acres of orchard planted on soils containing hardpan. For instance in 1915 it was reported that, "Great numbers of fruit trees have died in the north, the damage is due to excessive wet on poorly drained and undrained soils."⁴⁸ Exceptionally wet winters have caused

47 Shoemaker, J.S., and Taskey, B.J.E., 'Tree Fruit Production', New York, 1959, p. 18.

48 "The Agricultural Gazette of Tasmania", Vol. 23, No. 11, November 1915, p. 419.



Photo. 3. A large orchard block on the alluvial flood plain of the Huon River. Subsiding flood waters are still evident but these will have no ill effects on the trees due to the free draining alluvial soil.

105.

waterlogging on a widespread scale, as for example in the Huon Valley in 1947 and in the Huon and Tamar Valleys in 1956, resulting in the death of many long established trees. Commonly pears are planted where apple trees have failed due to bad drainage, as the pear is more tolerant of wet soils. Orchards planted on lowlying alluvial flats, though often inundated, are not adversely affected due to the free draining nature of the alluvial soils. Indeed orchards on the river flats at the confluence of the Huon and Mountain Rivers have flourished for almost a century despite repeated flooding. (Photo. 3).

Orchard productivity does not depend to any marked degree on soil fertility and the whole range of orchard soils produce high yields under good management.⁴⁹ Where soil fertility is especially low, high yields per acre are still maintained by denser tree plantings, as for example at Franklin in the Huon. On soils of high fertility such as alluvium, tree growth is very vigorous, trees are large and have to be pruned severely to encourage fruiting and to prevent the trees running to wood. This factor has been in part responsible for the removal of orchards on the flood plain of the Huon and Derwent and replanting on poorer soils on the higher slopes.

Soil deficiencies in certain minerals and trace elements are a feature of Tasmanian soils and periodically cause orchard disorders. Since most orchards are planted on podsoles in areas of high rainfall, extensive treatment with lime is a constant necessity, though some degree of soil acidity is essential. The appearance of internal

49 "Whether best results are on clays, sand or basalt is merely a question of management", Tasmanian Agricultural and Stock Department, Report for 1918-19.

cork in Tasmanian apples has been traced to deficiency of boron. In recent years a magnesium deficiency, causing defoliation and lower fruit yields, has become evident in orchards in the Huon Valley and D'Entrecasteaux Channel, particularly on poor, sandy soils which are inherently low in magnesium.

Soil erosion is a serious and widespread problem in Tasmanian orchards more especially in the south where many orchards are planted on steep slopes. Insidious sheet erosion is widely apparent from the exposure of the tree butts on the upper parts of sloping orchard blocks and the accumulation of silt piled as high as the tree crown in the lower portions. (Photos. 4 and 5). Gully and rill erosion occur intermittently after heavy rains of short duration known as 'flash floods', and are greatly encouraged by the almost universal practice of clean cultivation between the trees up and down the slope. The destruction of woodland cover on the upper slopes and ridges by burning off the undergrowth to allow rough grazing and the clearing for pasture land, has generally contributed to the increased speed of surface run off onto the orchards on the lower slopes. The painstaking task of replacing soil washed down slope has come to be regarded as an inevitable part of orchard practice.

Flood damage to orchards is also associated with periods of heavy rainfall. The upper Huon and Mountain River systems, with their sources in areas of high rainfall, are particularly prone to periodic flooding. The river flats are inundated, trees are washed away or undermined, limbs broken by logs and debris, the top soil scoured away where the main stream breaks across a meander loop (Photo. 6) and the orchard left littered with debris which may take many weeks to clear.



Photo. 4.

Bad gully erosion after heavy rains, May 1960. Erosion has been aided by inter-row cultivation up and down the slope. Glen Huon, Huon Valley.

Photo. 5.

Deposition of silt up to the crown of the trees at the lower end of a sloping orchard block. Glen Huon, Huon Valley.



Photo 6.

After effects of flood damage to an orchard planted on the narrow alluvial strip bordering a small coastal stream. Franklin, Huon Valley.

4. Accessibility as a Factor of Orchard Location.

Commercial orcharding in Tasmania depends to a very large extent on overseas markets, consequently ease of access to a collecting centre and port has been of prime significance in selection of orchard location. At the time of the main commercial plantings in the south the chief means of bulk transport was by small river craft. The much indented, drowned coastline of the south-eastern corner of the island afforded an easy and safe line of communication to the major centre and port of Hobart. A coastal, estuarine or a site in a major valley opening to the sea was therefore the most attractive orchard location. Commercial orchards were established along the water frontage of the Huon Valley, the D'Entrecasteaux Channel, the Derwent Valley, South Arm and Tasman Peninsula, with each farm and settlement possessing its own jetty for the transhipment of fruit.

In the later commercial plantings of the early part of the twentieth century, railways played an increasingly important part - though in the main the orchards on the West Tamar relied on river transport with water frontage sites and numerous river jetties. But at Spreyton, Lilydale, Scottsdale and the upper portions of the Tamar in the north and at Bagdad and Kempton in the south, orchard development was based on transport of export fruit by rail.

Today almost all fruit is transported from the orchard to the port or local urban market by road transport. This naturally allows much greater flexibility in choice of orchard location. However, the impact of motor transport has been slight, for very few orchards have been planted since its introduction early in the 1920's, though it seems certain that were fresh plantings on a large scale to be made, the high costs of freight would limit them to within a short distance of the major shipping points. Perhaps the greatest

significance of motor transport has been to allow easy access of urban motorist customers to the orchard - as the large rise in roadside sales indicates. A site fronting onto a main road has replaced the railway or water frontage location as the most economically attractive.

It would appear that commercial orcharding in Tasmania is most closely related to climatic conditions both as to general success and to fluctuations in volume of production. Though mean conditions in general are highly favourable the anomalies and extremes do cause heavy crop losses in some seasons. For instance, of the 12 seasons from 1949 to 1960, 3 have been unfavourable and the remainder average to above average. (Table 18). The weather hazards which are responsible for the most frequent and serious crop reductions are cool, cloudy, rainy weather in the blossoming period, radiation frosts, late summer and autumn droughts, excessive summer heat causing sun scald, wind damage, pests and diseases which are an expression of climate and above all hail.⁵⁰ The impact of adverse spells of weather is perhaps of greater significance to the individual grower than on the

50 The 1959/60 fruit season is likely to be long remembered by orchardists as a freak season when several such periods of adverse weather combined to reduce a potentially bumper crop to an average one (below average in the south). After a very heavy set of fruit, hail damage in December reduced the apple crop by 1,500,000 bushels, a summer drought by a further 1,000,000 bushels and sunscald, gales and floods accounted for additional losses.

Table 8. Weather Conditions Affecting the Production of Apples and Pears - 1948 to 1960.

	WEATHER CONDITIONS	PRODUCTION (bushels)	
		Apples	Pears
1948/49	Unfavourable season, fruit setting affected by cold weather, severe hail storms in south. A late harvest.	2,562,000	271,000
1949/50	Very bad drought in south. Fruit under sized, below average crop.	4,794,000	268,000
1950/51	Good conditions in spring but a dry autumn. Gale damage in north and south in February and March. Hail damage on Tamar.	4,848,000	306,000
1951/52	Poor spring - wet, humid and warm caused bad infestation of black spot. Late conditions favourable. Good average crop.	4,930,000	306,000
1952/53	Wet unfavourable spring weather affected setting of blossom and hindered application of sprays. Black spot caused large amounts of blemished fruit. Hail damage in Huon. Poor crop and season.	3,757,000	323,000
1953/54	Favourable weather at blossoming time with good rains to size fruit in early summer. A good crop free from blemishes.	5,304,000	360,000
1954/55	A good season in spite of spring frosts in the north. A warm, dry summer fruit rather small but unblemished.	5,009,000	426,000
1955/56	Very heavy set, good growing season, large fruit. Hail damage serious in December and January.	5,926,000	537,000
1956/57	Abnormally wet winter caused root damage. A cold wet spring with a poor set of fruit was followed by a summer drought. Fruit were small, lacked colour and were late in maturing.	3,401,000	295,000
1957/58	Very heavy set and excellent growing conditions though hail damage severe in south especially at Cygnet.	6,635,000	566,000
1958/59	Cold weather in spring caused a poor set of fruit. Dry summer with sun scald damage in south in January.	4,983,000	433,000
1959/60	Very heavy set of fruit but heavy losses due to hail, summer drought, sun scald, floods and gales.	5,473,000	

total crop, for crop reductions are rarely equally apportioned.

Within the obvious climatic limits there remain many areas in Tasmania where climate, location and site are eminently suited to orcharding - though economic factors preclude any new plantings. Even in the orchard regions there are few places where orchards are continuous and many potential sites remain unoccupied. The past selection of orchard sites has in fact rarely been based on physical conditions - other than good accessibility and general suitability for agriculture - rather it has been a case of empirical development. Fundamental contrasts in the process of selection emerge between the northern and southern regions. In the north plantings were mainly speculative with availability of land, not suitability the criteria of choice. There has since been constant adjustment to site as adverse physical factors - particularly poor soils and drainage - have necessitated contraction to the most favourable sites. In some aspects of climate and situation the Tamar has superior growing conditions to the south but there is the burden of a legacy of unwise plantings to contend with. Orchard location in the south was determined by a process of trial and error with plantings gradually expanding over a period of forty years. During this time the suitability of climate and soils were proved by the excellence of the fruit produced.

Despite the somewhat haphazard development the early selections of orchard locations have proved generally successful both as to climate and site. That orchards are well sited is borne out by the 1948 survey when as few as 2% of the total orchards were recorded as poorly sited.⁵¹

51 'The Tasmanian Apple and Pear Industry', Bureau of Agricultural Economics, Bulletin No. 6, Canberra 1950, pp. 39 and 40.

Tasmanian orchard holdings are able to grow apples and pears as a near monoculture - under these conditions a complete crop failure would be disastrous - while average yields, now some 300 - 400 bushels an acre, are among the highest in the world.

II. THE PATTERN OF PRODUCTION.

1. The Distribution of Orchards.

The Tasmanian pome fruit industry is characterised by its high degree of concentration in a number of scattered but well defined localities. Although of very limited extent compared with other forms of land use (in 1959 there were 16,400 acres of apples and 1,400 acres of pears) in the major producing regions of the Huon Valley, D'Entrecasteaux Channel, Tasman Peninsula, the Derwent Valley, Triabunna, the East and West Tamar and the Mersey, orcharding is either the major cash crop or a highly significant one. (Fig. 9).

The orchards mainly occupy the lower valley slopes or level benches above, with the peripheral blocks merging with the bordering eucalypt woodland. Only rarely is the orchard land continuous but is broken up within each region into a number of distinct units by tracts of woodland or poor soils. The greatest intensity of fruit culture is reached on the western shore of the middle Huon Valley where over 70% of the improved agricultural land is devoted to orcharding. (Fig. 9). The most fragmentary pattern occurs along the Tamar where the orchards are concentrated locally around a number of small centres.

Orcharding is a highly specialised form of agriculture which is not easily combined with other types of farming in a mixed economy. However, in recent years orchardists have usually introduced a 'side line' to avoid the dangers of over-specialisation in a monocultural economy. The production of dessert apples is the primary occupation of the vast majority of orchardists. Pears are grown on 65%¹ of holdings, but as

1 'The Tasmanian Apple and Pear Industry', op. cit., p. 33.

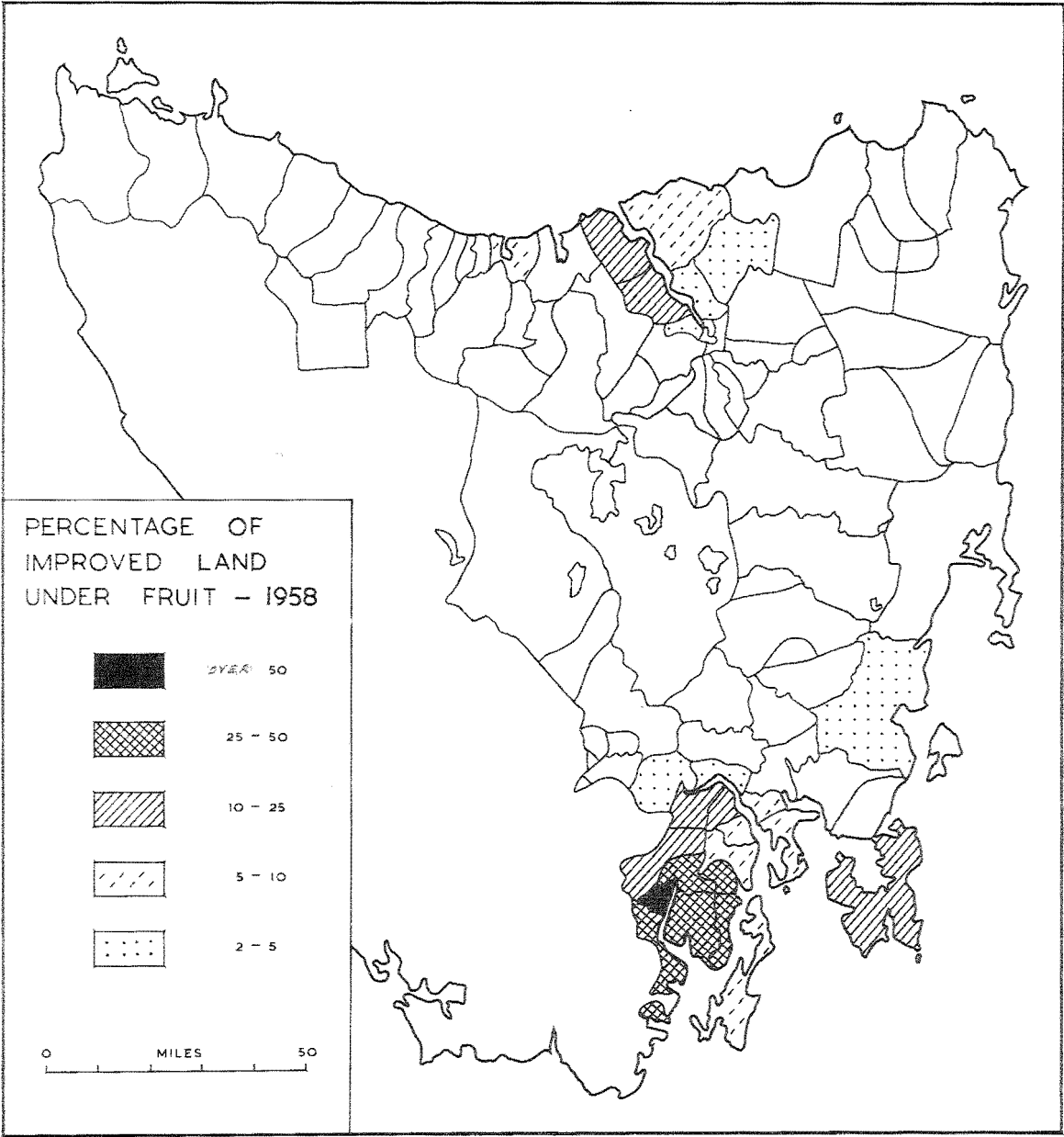


Fig. 9.

a secondary crop, the proportion of apples to pears being 11:1.

The leading apple producing region is the Huon Valley with 63% of the bearing trees. This overall dominance is growing as minor centres of production decline. The Tamar Valley comes second with 13% of the bearing trees but is closely followed by another southern region, the D'Entrecasteaux Channel with almost 12%. The remaining regions are relatively minor producers; the Mersey with 5%, Tasman Peninsula 4%, the middle and lower Derwent Valley 2% and Triabunna with under 1%. (Table 19 and Fig. 10).

Table 19 Bearing Apple Trees, Numbers and Regional Percentages, 1939, '49 and '59.

Region	1939	1949	1959
Mersey	128,672 4%	122,806 4.5%	106,484 4.5%
West Tamar	321,500 10.5%	287,094 10%	215,630 9.3%
East Tamar	135,271 4.5%	119,044 4.2%	91,546 3.7%
Derwent and South-East	374,787 12%	177,335 6%	51,530 2.25%
D'Entrecasteaux Channel	348,686 11%	373,591 13%	277,408 11.8%
Huon Valley	1,636,537 53%	1,685,764 58%	1,528,364 63.7%
Tasman Peninsula	101,046 3.2%	100,374 3.5%	84,858 3.75%
Triabunna	27,600 .8%	24,529 .8%	24,827 1%
<u>Total</u>	3,105,228	2,907,538	2,353,626

Source. Tasmanian Statistics, 1938/39, 1948/49 and 1958/59.

Pears are grown in conjunction with apples throughout the major orchard regions. Only in one district, Clarence, on the Eastern Shore of the lower Derwent, do pear trees outnumber apple trees and a small number of orchards produce pears only,

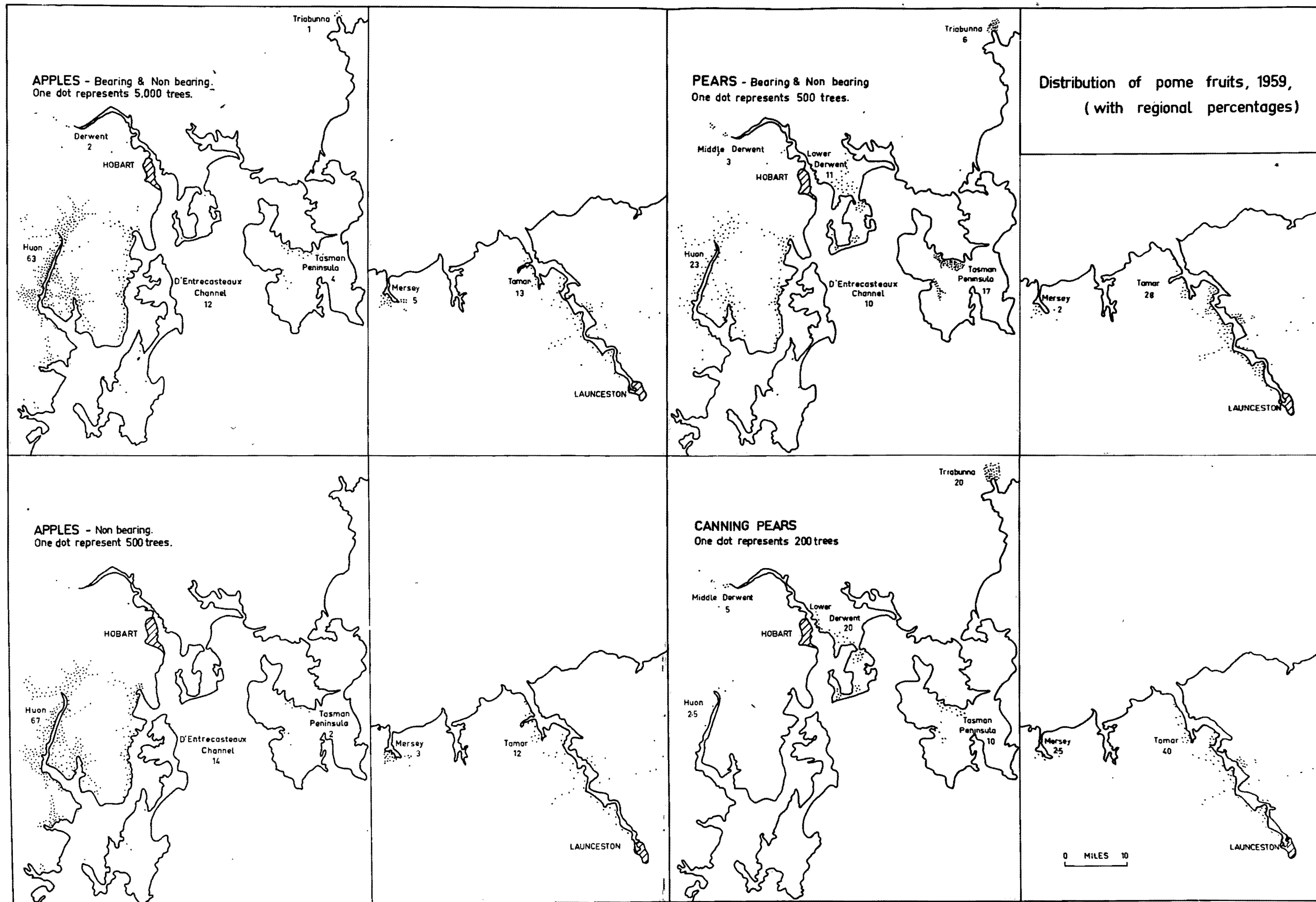


Fig. 10

(Table 21). The largest plantings are along the Tamar, which has 28% of the bearing trees and is followed by the Huon Valley with 23%. The Tasman Peninsula 17%, the middle and lower Derwent Valley 14%, the D'Entrecasteaux Channel 10% and Triabunna 6%, are the other major producers. (Fig. 10).

Table 20 Bearing Pear Trees, Numbers and Regional Percentages, 1939, '49 and '59.

Region	1939	1949	1959
Mersey	6,240 2%	5,324 2%	4,960 2.5%
West Tamar	78,000 25%	62,266 23%	46,035 22%
East Tamar	15,255 5%	16,179 6%	13,073 6.5%
Derwent and South-East	65,165 21%	54,010 20%	28,950 14%
D'Entrecasteaux Channel	26,900 9%	23,663 9%	20,431 10%
Huon Valley	81,158 26%	73,492 27%	48,769 23%
Tasman Peninsula	21,000 7%	22,166 8%	34,938 17%
Triabunna	13,357 4.5%	15,097 5%	12,928 6%
<u>Total</u>	311,000	270,445	211,330

Source. Ibid.

The emphasis on pears is greatest on the West Tamar and in the south-eastern group of producers, where milder and sunnier growing conditions favour pear production. In the Derwent Valley, Tasman Peninsula and at Triabunna, pears amount to as much as one third of the total pome fruit crop. Canning pears, chiefly the William's Bon Chretien variety, are more highly localised in the warmer, drier districts of the south-east and the West Tamar, with very few trees in the cooler, moister Huon Valley. (Fig. 10).

Table 21 Distribution of Apple and Pear Orchards, 1948.

Region	Total Orchards	Orchards with Pears	Orchards with Apples only	Orchards with Pears only
Huon Valley	1,088	637	451	-
D'Entrecasteaux Channel	251	194	57	-
Triabunna and Tasman Peninsula	69	66	3	-
Derwent and South-East	142	89	53	8
Tamar Valley and North-East	260	217	43	1
Mersey	111	48	63	2
<u>Total</u>	1,921	1,251	670	11

Source. 'The Tasmanian Apple and Pear Industry', op. cit.,
p. 33.

Over the last decade the area of apple orchards has declined from 19,338 acres to 16,400 acres and that of pears from 1,800 to 1,400 acres. This has been a period of contraction with the elimination of marginal and low yielding orchards in the smaller, outlying centres of production, an adjustment enforced by market conditions. The greatest loss of apple trees has been in the south-east, particularly the Derwent Valley which has experienced a 50% decline. (Fig. 11). A number of the small outlying centres, for example at Bagdad, Kempton, Sorell and Bridgewater, have now gone entirely out of commercial production. Of the major regions, the West Tamar 20%, Lilydale 30% and the D'Entrecasteaux Channel 36%, have experienced the sharpest drop in the numbers of bearing trees. (Fig. 11). The Mersey, Tasman Peninsula and Triabunna are regions which have remained relatively stable. The Huon Valley, always the leading producer, has become increasingly dominant with only a slight decline. There has, however,

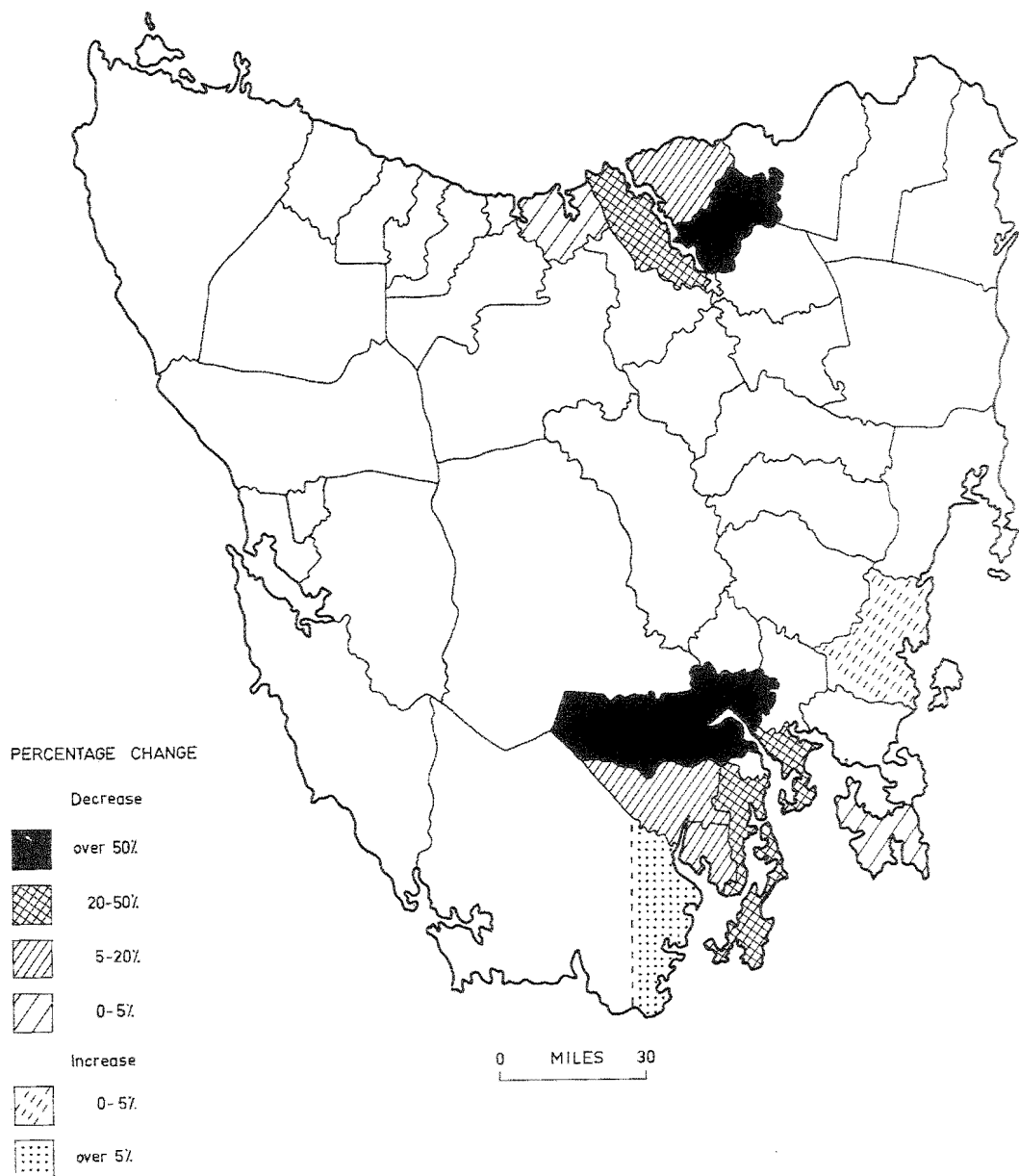


Fig. 11. Percentage Change in Numbers of Bearing Apple Trees, 1949 - 1959 (by municipalities).

been a movement towards the greater dominance of the middle and lower parts of the valley with the loss of orchards in the upper section. The distribution of non-bearing trees (Fig.10) suggests that these trends will continue, but at a decreasing rate. Old trees are being replaced by new stocks and the number of non-bearing trees has doubled since 1949. However, only in the extreme south of the Huon Valley are new plantings being made and a significant increase in acreage is taking place. (Fig.10).

The number of pear trees declined by 22% between 1949 and 1959 and was heaviest in the two leading regions, the Huon Valley 30% and the West Tamar 25%. Production is becoming increasingly concentrated in the south-east, especially on Tasman Peninsula where plantings have risen by 50% to 17% of the total. However, a further decline in total acreage appears likely as the present number of non-bearing trees is only half the 1949 figure. (Table 20). This is in spite of relatively good prices and market prospects for pears shipped to the United Kingdom.

2. The Orchard Holdings.

1) Land tenure.

Almost without exception orchard holdings in Tasmania are owner occupied. Since the pioneer days the pattern of land tenure has been a simple one of freehold ownership within the ring fence farm. Indeed the very nature of this type of farming which involves high capital investment,² long term planning (it takes at least 8 years from planting for apple trees to reach full bearing) and the intensive methods and

2 Many of the small growers are forced to mortgage their properties because of the expense of buildings and equipment and the large amounts of working capital needed, for example, approximately £1,500 is needed annually to produce and pack a 2,000 bushel crop.

high degree of personal interest and experience in management necessary, makes it ill suited to tenancy. However, some large estates are successfully handled by managers, for instance the Rosetrevor estate at Triabunna. A feature which has become relatively common in recent years is the practice of renting or buying adjoining orchards as they fall vacant to form a larger and more economic farm unit.

ii) The size of orchards.

The small family unit is characteristic of the Tasmanian orchard holding, consequently orchards tend to be small - 70% are less than 12 acres (under 2,000 trees) and more than 90% are under 21 acres (under 3,500 trees). Small holdings are common, many of them worked on a part-time basis and large orchards are few, only 3% are more than 30 acres and a mere 1% more than 60 acres.³ Although these figures relate to size of orchard only and not to the total size of the holding (which may be several times greater), much of the balance of the holding is normally woodland and the orchard blocks contribute the major part of the farmer's income.

The small average size of the Tasmanian orchard is likewise reflected in the total production of apples. Some 57% are grown on orchards of less than 16 acres (2,500 trees) and 80% on orchards under 27 acres (4,500 trees) while orchards of 40 acres and over only contribute 11% of the total production.⁴

Within the state pattern there is a variation in size of orchards between the different regions. The south has the smallest average size - 14 acres, due in large measure to the earlier development and the original density of the natural forest cover. This resulted in smaller blocks being

3 Ibid p. 3.

4 Inglis, I.G. and Fergusson, D.J., op. cit., p. 4.

cleared and very dense tree planting. Northern orchards are on the whole considerably larger - 20 acres is the average size, reflecting the later planting and wider tree spacing. (Fig.12).

A recent trend has been towards an increase in the size of orchard holdings, by either renting or buying adjacent holdings as they fall vacant. Economic pressures and increased mechanisation have made it both necessary and possible for the owner operator to increase his production. More effective use is also being made of the total holding by further clearing of woodland and sowing the land to permanent pasture or less frequently planting young apple trees. (Fig. 12).

iii) Size of orchard blocks.

There are regional differences in the size of individual orchard blocks. The Tamar orchards commonly have large blocks of from 15 - 20 acres in size, due to their purely commercial development, ease of clearing and the planting of small trees widely spaced. The Mersey area was largely planted on the basis of 10 acre blocks in a manner similar to that on the Tamar. In the south many orchards began with blocks of only a few acres, since in this region orchards were planted earlier, settlers lacked capital and equipment and land clearance was difficult and expensive. (Fig.12). More recent clearings and plantings have been on a scale more comparable with the north and are easily recognisable by the larger size of blocks and smaller trees.

iv) The pattern of plantings.

Apple and pear trees are planted in rows almost entirely on a square system. In 1949, out of a total of 1,921 orchards, 1,814 were planted on the square system and only 91 made use of the triangular system, chiefly along the Tamar.⁵

5 'The Tasmanian Apple and Pear Industry' op. cit., p. 36.

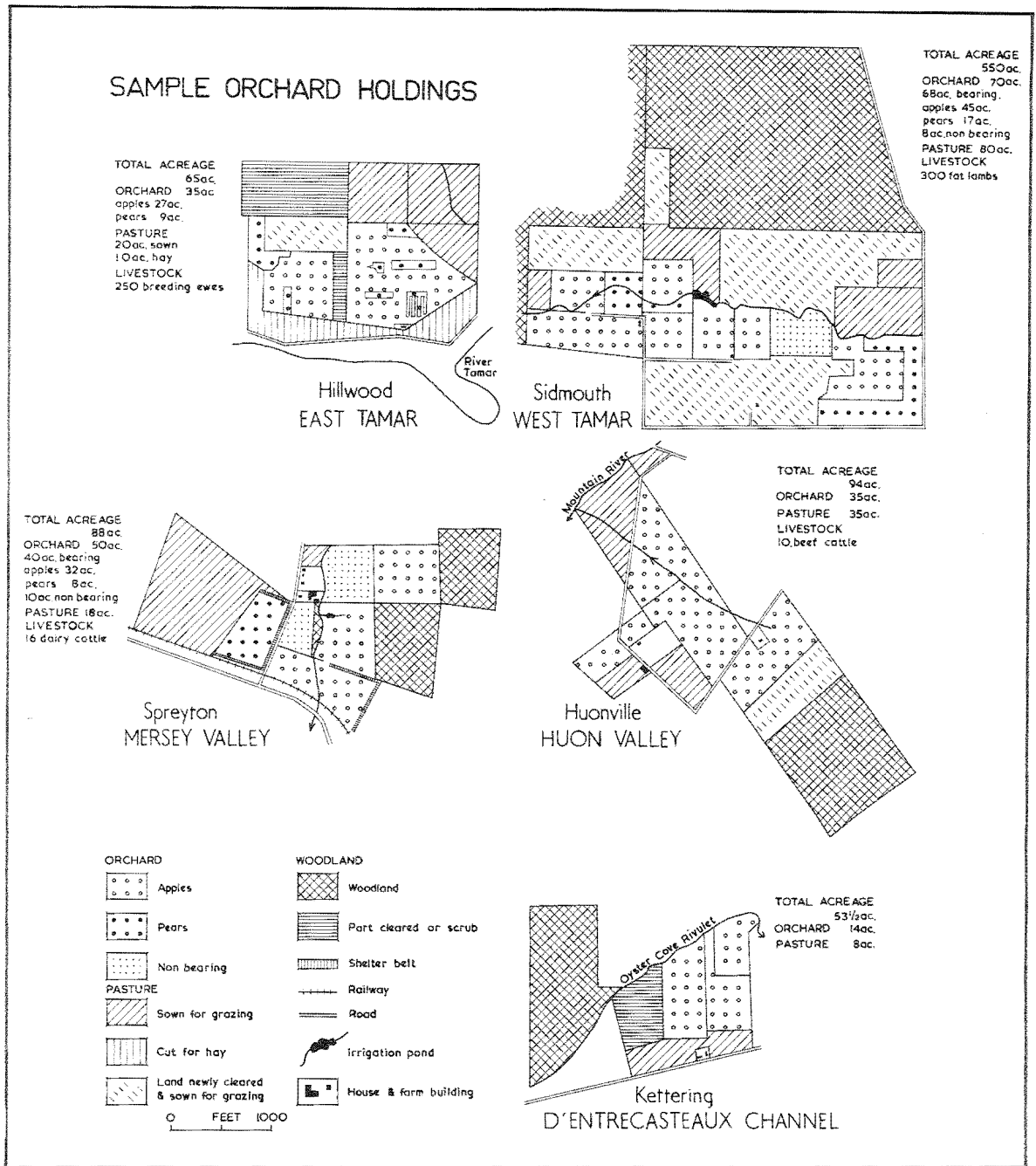


Fig. 12.



Photo. 7.

An old apple orchard in the Huon Valley, characterised by dense plantings, large open centre shaped trees and careful inter-row cultivation.

Photo. 8.

New and old orchard blocks on heavy clay soils at Spreyton. The wider tree spacings are in direct contrast with the very dense plantings of the southern orchards.



Photo. 9.

A newly planted block of apple trees in the Mersey Valley. Recent plantings in the north have been on the denser southern pattern of 160 - 170 trees to the acre. A case mill is in the background.

Density of planting differs greatly between the northern and southern regions. The southern orchards are the more densely planted, the trees being 16 - 17 feet apart or 160 - 170 to the acre. But this density is almost doubled in parts of the lower Huon Valley where as many as 300 trees to the acre have been planted.⁶ In the north the density of planting is far less with trees 18 - 20 feet apart or 130 - 140 to the acre. This difference in tree density is accentuated by the smaller size of trees in the north where planted with the weaker Northern Spy stock, and the much greater tree growth allowed in the south,⁷ more especially on the older orchards.

The earliest commercial orchards were planted with separate rows of different varieties with the result that some orchards grew 20 or more varieties. This large number of varieties was later to prove a handicap and the present tendency is to consolidate each variety into a distinct block of several hundred trees so facilitating tree culture. Pear trees are normally combined with apples in the one orchard block and separate blocks of pear trees are comparatively rare.

v) Cultural practices.

Orcharding is a type of farming requiring a high degree of skill in husbandry. Without constant care fruit trees deteriorate rapidly and the success of any orchard enterprise depends to a large extent on the cultural practices. Orchard management and cultural practices are in most respects uniform throughout Tasmania. Where differences do arise, as

6 In commercial orchards in the U.S.A., 34 - 40 trees per acre is usual in the east and 40 - 50 in the west.

Olmstead, C.W., op. cit., p. 195.

7 The present trend is towards smaller trees which makes spraying and pest control simpler and allows pruning, thinning and harvesting to be done from ground level.

between north and south, they are largely a matter of distinction in intensity of application of technique.

Undoubtedly the most important part of orchard management lies in the protection afforded by chemical spraying against the ravages of the numerous insect pests and diseases, for some 90% of poor fruit can be directly attributable to damage from this cause. "In the routine practice of orchard management it can safely be said that the control of pests and diseases ranks as the most important operation. The success or failure of the season's crop will largely depend on the efficiency of the grower's spraying operations."⁸ Spraying operations begin early in September, prior to the appearance of the fruit blossom, and continue at intervals of 10 to 14 days throughout the critical fruit setting and growing period until harvesting begins early in March. Pears, more susceptible to pests and diseases, receive rather more attention than apples.

The practice of clean cultivation between the rows of trees is almost universal. There is no inter-row cropping on the British pattern and in fact it would be impossible in the very densely planted southern orchards. The land is first ploughed in the late spring or early summer to turn in the winter grown cover crop of lupins, oats or beans or merely the accumulation of weeds, to provide green manure. Thereafter the orchard is kept free of weeds by frequent discing until the end of January. In the south and to some extent in the north-west a second cultivation is made in the early winter, ploughing the soil in towards the roots of the trees leaving a drainage furrow in the centre of each row - in the spring ploughing the soil is restored to the centre. This practice is rarely used by the Tamar Valley growers who rely on one ploughing and several disc cultivations. The grassing down of

8 Hoare, A.H., 'Commercial Apple Growing', revised ed.

London, 1948, p. 185.

orchards under a permanent cover crop is, as yet, rare in Tasmania. However, the success achieved in Britain and North America with sod culture has prompted a few of the larger and more progressive growers to try the method on an experimental scale.⁹ But in general the sight of an orchard under grass is still regarded as evidence of neglect and eventual removal. (Photo.10).

The technique of pruning varies in some degree between the north and the south. In all areas pruning is used firstly to ensure a correctly shaped tree with an open centre, subsequent pruning is a routine winter operation to discourage tree growth and encourage fruiting. The southern growers with their larger and more closely planted trees, prune more heavily and open out their trees, (Photo.7) while the northern producers with smaller trees, prefer a wineglass shape.

The irrigation of fruit trees has been practiced by growers in the low rainfall area of the Derwent Valley since the 1860's but only in recent years has its need and value been recognised by growers in the heavier rainfall districts of the south. The application of irrigation water in the frequent dry spells during the summer months at a critical stage in the growing period, has been found to prevent fruit shrinkage and to increase the size of small fruit. Pears, especially the canning varieties, are now irrigated on a considerable scale on the West Tamar, the Tasman Peninsula, Triabunna and in the lower Derwent Valley. In the primarily apple growing districts of the Huon Valley and D'Entrecasteaux Channel, growers are fast installing their own irrigation facilities.

The earliest method of irrigation was by direct

9 Only when irrigated.

flooding of the land on the immediate river flood plain, as along the lower Derwent Valley and the upper Huon. But as the majority of orchards were sited on the lower valley slopes, irrigation on a large scale was considered both impossible and unnecessary. Today these orchards are irrigated from small ponds or reservoirs behind earth catchment dams constructed in a suitable gully or depression, or by direct pumping from nearby perennial streams. The water is applied as required from December to the end of the harvest period in May using overhead spray irrigation.

The widespread adoption of irrigation is but part of a general trend towards increased mechanisation and the intensification of farming methods. Due to the typical family unit and the intensive nature of cultural practices, orcharding is naturally regarded as a highly specialised type of farming which does not lend itself readily to mechanisation. But economic pressure and the shortage of skilled labour is forcing mechanisation on the orchardist, replacing many of the traditional hand methods, for example, the tractor, power spray, mechanical grader and bulk handling equipment have all become commonplace on Tasmanian orchards since the war.¹⁰ The horse is fast disappearing as the chief means of motive power, except where steep slopes are planted as in the Franklin and Geeveston districts of the Huon Valley. Certain operations such as grafting, pruning, fruit and leaf thinning, propping and harvesting are still performed by hand, but even mechanical harvesting could be introduced in the near future.

Current trends then are towards greater intensification and the introduction of more machinery in an effort to reduce production costs, increase efficiency and to combat market difficulties. The northern orchards are somewhat better placed in this respect, for wider tree spacings, larger

10 In 1959 10% of the growers producing 30% of the crop had bulk handling equipment. "The Mercury", August 18th 1960.

holdings and plantings on easy slopes favour the introduction of machinery.

The standard of orchard management is consequently high and becoming increasingly so. In 1949, 73% of orchards were classified as in good condition, 16% as fair and only 6% as bad,¹¹ since this survey standards have generally improved. It is highly significant that the highest proportion of good orchards - 80%, were in the Huon Valley, while the greatest number of unhealthy trees and neglected orchards were on the West Tamar and in the Derwent Valley, both areas of declining importance.

The distinctions in cultural practices which arise between northern and southern areas are mainly ones of less cultivation and less intensive cultural methods in the north, where plantings are wider spaced and holdings larger. Many orchard operations were evolved in the early pioneer days of commercial plantings in the Huon and Derwent Valleys and these have persisted, though with continual modifications. Certainly this is the case with the practice of clean cultivation and the open centre tree shape. The differences which occur in the north are in all probability a legacy of the influence Victorian growers had in the northern planting boom of the early twentieth century.

vi) The varieties.

With respect to areal distribution there is widespread uniformity of the varieties of apples grown. The main varieties, Jonathon, Sturmer, Democrat, Granny Smith, Cleopatra, Delicious, Crofton, Tasman Pride, etc., are found in much the same proportions in all the main growing districts. There is perhaps a slight tendency for the coloured varieties to do better in the drier and warmer areas of the north and conversely for the green varieties to reach a higher standard in the south,

11 'The Tasmanian Apple and Pear Industry', op. cit., p. 39.

but it cannot be said this physical factor has expressed itself in terms of distribution. One major variety only, the Cox's Orange Pippin, seems to show a marked regional preference for the Tamar area.

The dessert pear varieties have a similar overall pattern of distribution. Canning varieties of pears have a more limited distribution in the warmer, sunnier areas of the Tamar, the lower Derwent Valley, Tasman Peninsula and Spring Bay. (Fig. 10).

An important factor in the apparent uniformity of varieties grown is the need for the orchardist to spread the harvesting period over as long a time as possible. Consequently Tasmanian orchards specialise in up to 12 different varieties of apples calculated to mature throughout the harvest period from late February to early June. (Table 22).

Table 22 Harvesting Period for the Main Varieties of Apples, 1948.

<u>Early</u> (from Feb.)	Worcester Pearmain Cox's Orange Pippin	13%
<u>Early</u> <u>Mid-Season</u> (from early or mid March)	Tasman Pride Cleopatra Jonathon Geeveston Fanny	40%
<u>Mid-Season</u> <u>Late</u> (from late March or early April)	Delicious Scarlet Pearmain Sturmer Pippin Granny Smith	29%
<u>Late</u> (from mid or late April)	Crofton Democrat	16%

Source. 'The Tasmanian Apple and Pear Industry', op. cit.,
p. 18.

There has been a tendency to reduce the large number of varieties of apples and pears grown in Tasmania since the time of the pioneer plantings. Increasing market pressure has accelerated this trend. Today 95% of the potential apple

crop comes from 12 varieties (Table 23) - 80% come from only 6 varieties and there is an ever increasing concentration on the more favoured varieties and a corresponding decline of those varieties which are no longer popular, for example Scarlet Pearmain, London Pippin, French Crab, Alfriston, Rome Beauty, Dunns Seedling, etc. In 1947, over 200,000 trees with a potential production of 600,000 bushels were classified as 2nd grade varieties.¹² Many of these have now been grafted to more popular varieties, especially the Jonathon, for instance between 1949 and 1959, 800 acres of apple trees were converted in this way. So strong has this trend become that there is now the danger of over specialisation, for example in 1959 two varieties, the Sturmer Pippin and the Jonathon, accounted for over one third of the potential production of apples. (Table 23).

The older English varieties, so popular with the early settlers, have now practically no commercial value and are being replaced or converted to newer varieties, many of which have been introduced from North America, for example, Jonathon, Delicious and Golden Delicious. But locally raised varieties have also been propagated, the Democrat, Crofton, Tasman Pride, Legana, Geeveston Fanny, etc., and account for 22% of the total production. (Table 23).

There have been similar changes with regard to dessert pears. Nine varieties now account for most of the production, - 6 varieties produce 90% of which Winter Cole, (40%), Buerre Bose (20%) followed by Packham's Triumph, Doyenne du Comice and Glou Morceua are the leading varieties. The leading canning variety, the William's Bon Chretien (Bartlett), appears to be increasing in popularity with new plantings on the east coast at Spring Bay and on Tasman Peninsula.

¹² Ibid, p. 5.

Table 23.

The Main Commercial Varieties of Apples Grown in Tasmania, 1959
(in order of size of production).

<u>Variety</u>	<u>Potential Production</u>
Jonathon	1,350,000
Sturmer Pippin	1,307,500
Democrat	1,070,000
Granny Smith	733,000
Cleopatra	701,000
Delicious	367,000
Crofton	226,000
Tasman Pride	220,000
Cox's Orange Pippin	150,000
Geeveston Fanny	150,000
Scarlet Pearmain	145,000
Worcester Pearmain	70,000
Alfriston	58,500
Duke of Clarence	50,000
Golden Delicious	34,000
Ribstone Pippin	30,000
Rome Beauty	25,500
French Crab	24,000
Legana	14,500
Others	55,000
<u>Total</u>	<u>6,782,000</u>

The Main Varieties of Pears Grown in Tasmania, 1959.

Winter Cole	227,000
Packham's Triumph	83,000
William's Bon Chretien	82,000
Beurre Bosc	78,000
Doyenne du Comice	53,000
Glou Morceau	32,000
Josephine	23,900
Winter Nelis	14,500
Beurre d'Anjou	7,700
Others	6,400
<u>Total</u>	<u>608,500</u>

Source. Tasmanian Department of Agriculture.

vii) Labour supply.

The Tasmanian orchard holding is very much a family concern with family labour being by far the most important source of full-time labour. In 1948 out of a total of 2,682 full-time employees, 1,826 were members of the orchardists' own families - outnumbering other full-time workers by 2:1. In addition, a further 1,000 members of orchardists' families worked part-time.¹³

Ten acres of orchard land is the average amount one man can adequately handle on his own, with the exception of short periods of the crop year when the help of extra seasonal labour is necessary. It is therefore highly significant that some 45% of Tasmanian orchards are less than 9 acres in size. Intensive fruit growing requires a high degree of personal supervision and does not lend itself readily to organisation as a large scale undertaking.

The predominance of family labour is a common feature throughout the orcharding districts but is most marked in the lower Huon Valley, where family labour outnumbers other full-time labour by 5:1. In only one area, Spring Bay on the east coast, do other full-time orchard workers outnumber owners, due to the presence of a large orcharding estate run by a canning company.

Part-time labour is required for certain busy periods of the year; for pruning - an average of 6 weeks of the year, spraying - 3 weeks and harvesting - 12 weeks. This gives employment for some 2,000 persons drawn from the immediate local areas, such as seasonal workers,¹⁴ pensioners, shift workers and small holders, most of whom are skilled orchard hands.

13 Ibid, p. 5.

14 Who at other times of the year work at such occupations as sheep shearing, bark stripping, fishing, etc.

Table 24 Numbers Employed in Apple and Pear Orchards, 1948.

Region	No. of orchards	Orchardists' own family		Other full time workers	Seasonal Employment		
		full time	part time		pruning	spraying	harvesting
Mersey	111	51	108	20	23	51	121
Tamar	260	246	150	114	83	96	337
Tasman Peninsula and East Coast	69	75	33	101	14	13	105
Huon	1,008	1,116	509	483	270	163	1,037
D'Entrecasteaux Channel	251	255	133	92	85	70	184
Derwent Valley	142	83	86	47	41	56	98
<u>Total</u>	1,921	1,826	1,026	856	516	439	1,881

Source. Ibid, p. 38.

During the relatively short harvesting period, there is the need for large numbers of skilled and unskilled workers. Demands for labour far outstrip the immediate local supply and there is an influx of casual workers; men for picking and packing shed work, women and girls for packing. However, in all areas local workers (including the families of the owners down to the smallest child), form the nucleus of the labour force with the balance made up from a number of outside sources. Along the Tamar and the Mersey the nearby urban centres - Devonport for Spreyton, Launceston for the East and West Tamar, and George Town for the lower East Tamar - supply the bulk of this seasonal demand with many of the women packers going to the same orchard each year.

In the southern growing districts, with the greater extent and intensity of orcharding, Hobart can only supply some

50% of the casual labour - seasonal workers, students, etc., the remaining 50% coming from outside the state. Many of the latter are itinerant workers from the mainland states who move about the Commonwealth as a floating labour force harvesting a variety of crops; sugar cane - Queensland, grapes - Mildura, pears - Goulburn Valley. Commonly these people are new arrivals in Australia and comprise a wide variety of European nationalities; Germans, Hungarians, Yugoslavs, Finns, Spaniards, Dutch, Italians, Rumanians, Greeks, etc. A smaller proportion are overseas visitors on a working holiday, particularly New Zealanders. There is rather strangely, a strong preference based on nationality amongst the growers. New Zealanders, Finns and Germans, in that order, are much preferred to other nationalities in the belief that they show superior skill and working capacity. Women form up to one-third of this transient labour force. Normally they are on a working holiday from one of the mainland states, especially New South Wales and Queensland, but there is also a sprinkling of overseas visitors.¹⁵ The majority of growers who take outside casual labour supply temporary accommodation, consisting of small wooden cabins and many in addition supply fuel and power and some foodstuffs.

Though casual labour is plentiful, skilled permanent orchard labour is becoming increasingly hard to obtain. Since the war years orchard hands and their families can find more lucrative employment and far superior amenities in the larger urban centres. Many of the large growers are faced with a serious shortage of skilled labour as men leave for urban employment or move to the mainland states.

15 From information supplied by the Commonwealth Employment Bureau and by a number of growers.

3. Production and Yields.

The annual Tasmanian production of pome fruits has averaged over the last decade 5,000,000 bushels of apples and 400,000 bushels of pears.¹⁶ In recent years there has been both an increase in total production - 1958 was a record crop of 6,640,000 bushels of apples and 566,000 bushels of pears - and greater stability of production (Fig. 7). These trends do, however, mask the sharp decline in the number of orchards and the total acreage of fruit trees. (Fig. 7). In 1947 there were 21,112 acres of apples and 2,254 acres of pears, but by 1959 these figures had declined to 16,435 and 1,476 acres respectively. It is therefore apparent that increasing yields (per acre and per tree) from the remaining orchards are maintaining production at its present high level. The most important factors behind this rise in average yields are; improved chemical sprays reducing damage by pests and diseases, better cultural methods and more efficient management.

The highest yielding orchards with respect to size are those of from 5 to 20 acres (the 10 to 20 acre group in the south is the highest of all) where a large part of the work can be done by the owner. Under 5 acres orcharding is of necessity a side line run in conjunction with other types of farming or as a part-time occupation. Orchards of 40 acres and over have the lowest yields per acre.¹⁷ (Table 25). The correlation of orchard size and yields evidently reflects to some degree the great significance of personal supervision and management in this type of farming.

16 Marketable fruit only - the total production of apples is from 7,000,000 to 8,000,000 bushels.

17 'Tasmanian Apple Yields', Quarterly Review Agricultural Economics, Vol. III, No. 4, October, 1950, p. 156.

The highest yields of apples per acre are to be found in the south, with yields of over 400 bushels per acre and even over 1,000 bushels per acre are not uncommon. Yields are lower in the north-west and considerably so along the Tamar.(Table 26). In part this is due to the more sparsely planted and smaller trees of the north. However, yields per tree are consistently higher in the south and the highest yields of all are in the Huon Valley. (Fig. 13). The lowest yields per tree are in the rapidly declining areas of the south-east. This suggests that orchard husbandry and management reach their highest standards in the Huon Valley.

Pears do not show any marked regional variation in yields and the most obvious trend has been towards greatly improved yields from a declining acreage. (Fig. 14).

Table 25 Yields per Acre in Bushels, 1948.

Region	Size of Orchard					Total
	under 5 acres	5-10 acres	10-20 acres	20-40 acres	over 40 acres	
Northern	192	181	234	239	133	208
Southern	387	450	453	433	304	424
Tasmania	364	401	389	361	249	368

Source. 'Tasmanian Apple Yields', op. cit., p. 157.

Table 26 Average Production and Yields per Acre, 1956, (bushels)

	South	North	North-West	Tasmania
Average production per orchard	5,792	6,719	6,464	6,300
Average yields per acre	416.7	223.7	348.9	374
Average area in acres	14	20	17	16

Source. Inglis, I.G., and Fergusson, D.J., op. cit., p. 12

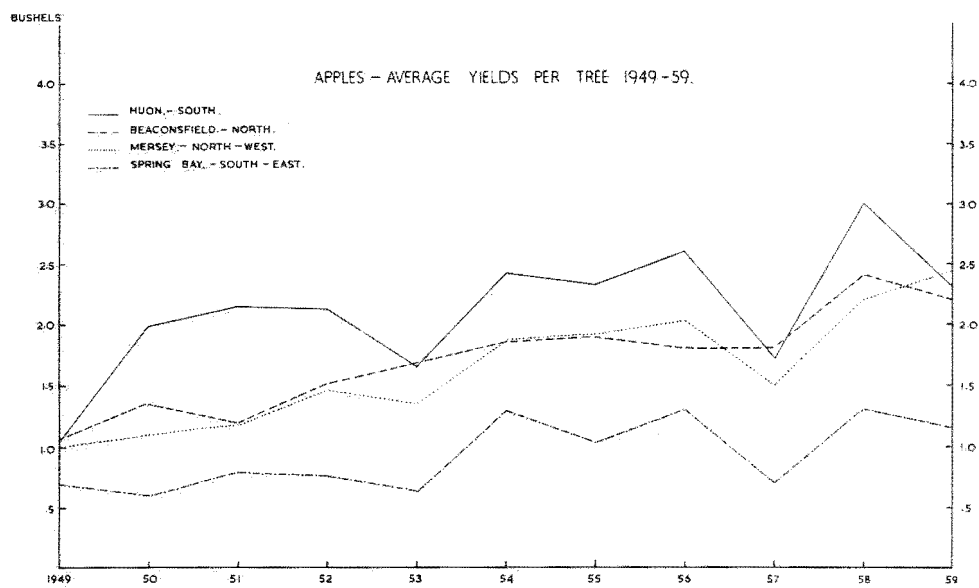


Fig. 13.

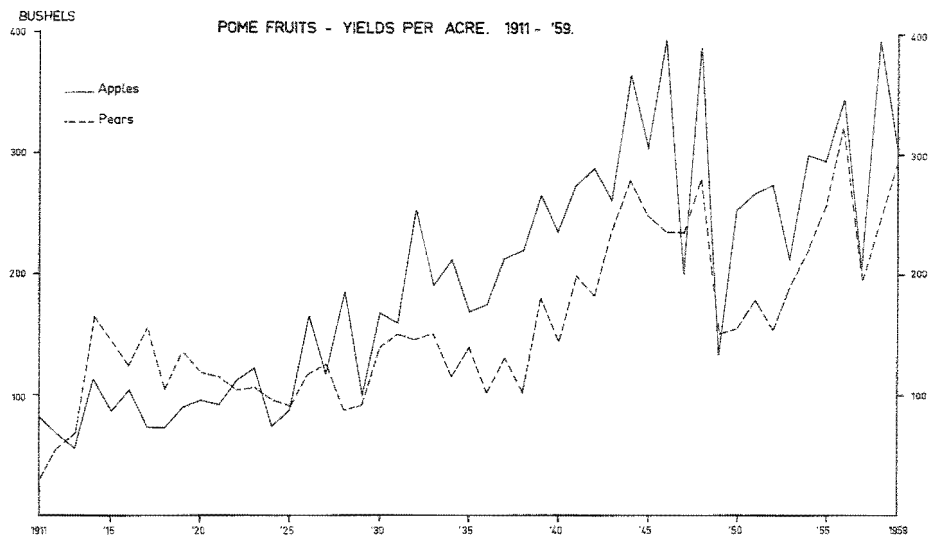


Fig. 14.

It is a feature of the orcharding industry that total production fluctuates from year to year, a large crop being followed by a correspondingly small one. In 1956 for instance the apple crop totalled 5,900,000 bushels, in 1957 - 3,400,000, 1958 - 6,800,000 bushels and 4,900,000 bushels in 1959.

Biennial bearing is caused by the heavy setting of fruit in one year, so lowering the capacity of the tree to produce fruit buds the following year. Later crops see-saw until they reach a normal crop once more. Physical factors can also induce the habit of biennial bearing, when for example frosts reduce the blossom and upset the rhythm of bearing. Biennial bearing is most noticeable in the older English varieties of apples. The newer varieties are less subject to yearly fluctuation, for instance, the Jonathon, Granny Smith, Democrat, and as these varieties gain in popularity, biennial bearing is becoming less of a problem.

4. The Changes in the Orchardng Pattern.

i) Diversification of the farm economy.

Until very recent years apples and pears provided the only source of income on the majority of orchard holdings, for example, in 1948 out of 1,921 pome fruit orchards, 1,260 or more than two-thirds, had no other form of production.¹⁸ Commercial orcharding was a near monoculture which did not lend itself readily to integration into a mixed farm economy. Other types of fruit (stone and berry fruits) were the crops most commonly associated with pome fruit production (on 20% of the holdings), other arable crops (6%), dairying (4%) and poultry and egg production (1.5%) were the other associate forms of production. In 1948 the degree of specialisation was highest in the Mersey Valley with 93% of orchard holdings having a one crop economy, and was followed by the lower Huon Valley

18 'The Tasmanian Apple and Pear Industry', op. cit., p. 3.

with 91%.¹⁹ The greatest diversity occurred in the minor producing areas of the middle and lower Derwent Valley where orcharding has traditionally remained part of a mixed farm economy associated with hops, stone and berry fruits and sheep.

Since the 1948 survey the position has changed greatly with a pronounced swing over by the majority of orchardists to some form of diversification. Most now supplement their income by small scale grazing of livestock or by growing other crops, though the small size of many holdings has restricted the extent of this change. There can be little doubt that rising costs of production and presentation in the face of insecure markets has made diversification advisable.

Not only has diversification become more widespread but there has been a decline in the crops traditionally associated with apples and pears. The prospects for stone and berry fruits are poor and considerable acreages have been removed. The overall change has primarily been the introduction of livestock; dairy and beef cattle and sheep, encouraged by current high prices for dairy products, meat and wool. In the Huon Valley and D'Entrecasteaux Channel the emphasis has been on beef and dairy cattle - to supply the expanding Hobart market. Dairying and fat lamb production have been introduced to many Tamar, Tasman Peninsula and Mersey orchards. Today most Tasmanian orchards have some livestock and this sideline production plays an increasingly significant part in the farm economy. (Fig.12).

However, diversification has only comparatively rarely taken place at the expense of existing orchard land. Orchard properties, more especially in the south, commonly have tracts of regrowth woodland or scrub on the steeper slopes. This woodland is now being cleared and sown to pasture so

19 Ibid., p. 33.

enlarging the effective size of the holding. Throughout the south, grassland farming is the only major competitive agricultural land use.

ii) Orchard age.

Apple trees are assumed to become commercially unprofitable at the age of 45 years, pears at 50 years.²⁰ Since the boom in plantings which ended after the First World War, there have been few new plantings of pome fruits. Consequently many orchards are now reaching the end of their economic life, in 1956 for example, 38% of apple trees were over 40 years old. Old trees tend to lose vitality and the fruit to decline in size, quality and colour. Although 45 years is a somewhat arbitrary limit and economic age does vary with the physical conditions, the variety, rootstock and cultural practice, it is evident that many Tasmanian orchards are nearing the end of their economic life. This trend is most apparent in the Tamar and Mersey areas where the majority of orchards are now over 40 years old. In addition, the northern orchards were largely planted with the Northern Spy rootstock which produced small weak trees, unlikely to display longevity. By contrast, orchards in the south have a greater percentage of young trees and orchards over 60 years and even up to 100 years are still bearing heavily due to the vigorous stocks planted, to ideal physical conditions and high standards of orchard management.

The policy adopted by progressive growers has been to rework or grub out old trees as they show signs of declining yields and to replace them with young trees. For the small orchardist this is not always financially possible and on the smaller holdings, orchards past the period of economic bearing have been grubbed out and replaced with pasture.

20 'The Tasmanian Apple and Pear Industry', op. cit., p. 6.

iii) Losses of orchard land.

The neglect of aging orchards reflects the general change in the economic factors controlling orcharding. As marketing conditions become progressively less favourable, the low yielding, unthrifty and marginal orchards are removed. In the south-east orchards were no more than enlarged farm orchards, commercially marginal making profits only in good seasons and neglected in bad years. Intensification of market competition and improving cultural methods are causing the traditional farm orchard to become sub-marginal and to be fast eliminated. The first signs of orchard neglect appear with the cessation of cultivation, trees become overgrown with lack of pruning and finally dead and diseased limbs appear as fungus diseases spread. Ultimately the trees are chopped down or uprooted, a common sight on the West Tamar, in the Derwent Valley, Bagdad, South Arm and in other parts of the south-east. (Photo. 11).

Competition for land use has resulted in the removal of some orchards. The higher prices for wool, fat lambs and dairy products has persuaded some orchardists to make a complete change in their farm economy. For example, dairy farming is an attractive proposition along the D'Entrecasteaux Channel and in the upper Huon Valley, to provide fresh milk for the rapidly growing Hobart market, while fat lamb production and dairying are increasing at the expense of fruit trees on the West Tamar. To some extent the mental attitude of the individual grower plays an appreciable part in such a change, many small producers²¹ are unwilling to face the extra work and

21 The larger orchards can increase efficiency and lower costs by becoming fully mechanised, the conversion of uneconomic varieties is an item of expense only the large producer can bear. On the other hand, the small family orchardist loathe to make a change involving so much capital, can 'draw in his belt' and wait for better days.



Photo. 10. A neglected orchard, uncultivated, diseased, unpruned and overgrown. Kingston, D'Entrecasteaux Channel.



Photo. 11. An abandoned and partially destroyed orchard block now used as grazing land in a rapidly declining orchard region. Bagdad, lower Midlands.

worry brought about by rising production costs and by present uncertain market prospects.

Where orchards have been planted around an urban centre the present expansion of suburbs has created competition with the inflated prices of building land which even valuable orchard land cannot compete with. Suburban housing development is eliminating orchards in the Hobart district, towards the north in the Glenorchy municipality, south along the D'Entrecasteaux Channel and on the Eastern Shore of the Derwent in the Clarence municipality. Around Launceston, orchards have been removed to make way for building along both banks of the Tamar. Along the West Tamar, orchards with a waterfront site have been sub-divided into building lots, particularly in the Gravelly Beach - Exeter district.

5. Land Utilisation in the Orchardling Regions.

The pattern of land use in the south; the Huon Valley, Tasman Peninsula and D'Entrecasteaux Channel is complex but nevertheless regular. The agricultural land is confined by rugged relief to the areas bordering the coast, estuaries or main valleys. Within these confines land use varies strikingly with height and slope resulting in a characteristic sequence of altitudinal belts of differing land use. (Fig. 15).

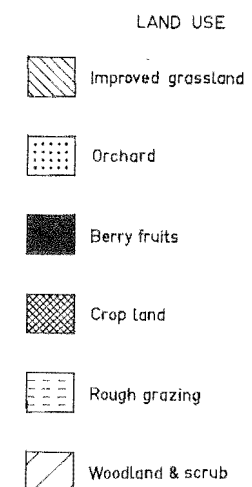
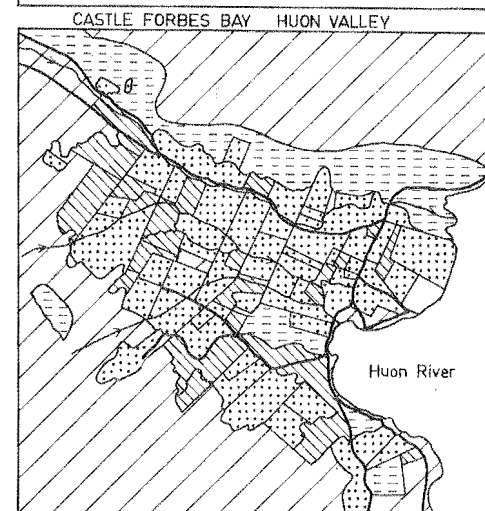
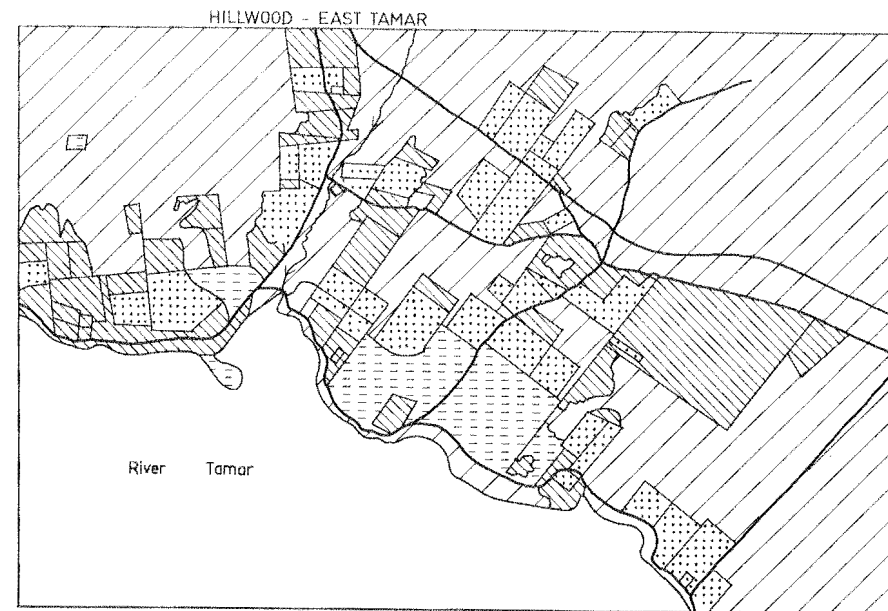
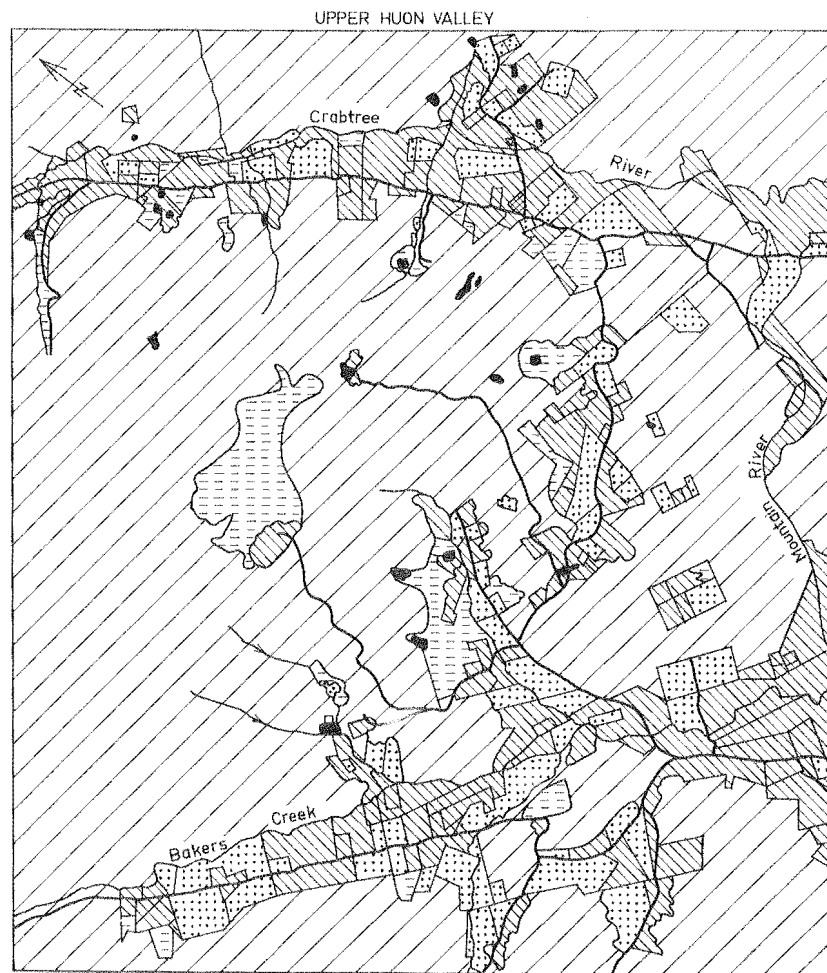
River flats. The narrow alluvial strips which border the main streams are liable to frequent flooding and are consequently largely under high grade permanent pasture. Orchards were once extensively planted on the flood plain of the Huon, Mountain and Derwent Rivers, but have now been largely removed due to excessive tree growth promoted by the rich soils. Hops occupy the river flats of the lower Mountain River at Ranelagh and the North-West Bay River at Margate. The fertility of the alluvial soils is made apparent by their utilisation, even in the narrow headwater valleys, while the valley sides remain forested.



Photo. 12. A Huon orchard holding, set back a short distance from the road with the large apple packing shed close by and surrounded by its orchard blocks. Orchard land occupies the lower slopes with the steeper upper slopes remaining covered by eucalypt woodland (chiefly stringy bark). The small areas of grassland have been recently cleared. Cygnet, Huon Valley.

The lower valley slopes. The gentle slopes (2° - 5°) and deep soils make this zone ideal for orchard plantings. Along the coast and river frontages of the D'Entrecasteaux Channel and Huon Valley orchards are extensively planted. (Fig. 10). On the western side of the mid-Huon from Huonville to Geeveston there is an almost unbroken series of apple orchards. Plantings follow the small tributary valleys inland gradually dying out as the valley sides steepen. In the major valleys aspect is of minor importance and both valley sides are utilised, but in the narrow tributary valleys the sunnier northern and eastern facing slopes only are planted. The major type of associated land use is permanent pasture, but some fodder crops are grown, chiefly hay and occasionally arable crops, mainly potatoes. This zone of land use is both the most extensive in area and the most intensively utilised, and very little woodland remains to be cleared.

The upper slopes and benches. On the upper valley sides, slopes steepen (15° - 25°) and soils become shallow and stony. As a result this area is largely under natural regrowth woodland, partially cleared scrubland or rough pasture invaded by bracken. The level benches at approximately 600, 900 and 1,200 feet, provide deeper soils and orchards have been planted, in some instances on a considerable scale, for example, at Braeside in the mid-Huon. The most widespread type of agriculture is the growing of berry fruits (raspberries, currants, strawberries, loganberries and gooseberries) planted where deeper patches of soils occur, though often on seemingly impossible slopes. The need to diversify the farm economy has caused many orchardists to clear stretches of this type of land and to sow it to pasture. This clearing has often proved to be unwise for the many newly seeded pastures bear the scars of gully and finger erosion.



Land utilization in the Huon & Tamar Valleys - Sample studies

0 YARDS 1000

Fig. 15

The plateaus. On the hill tops, usually over 1,000 - 1,200 feet are considerable tracts of plateau land. The higher rainfall caused this zone to be once covered by dense rain forest of blue gum (*eucalyptus globulus*), stringy bark (*eucalyptus obliqua*), swamp gum (*eucalyptus regnans*) and gum top (*eucalyptus gigantia*), but of which only the remnants remain. Considerable but isolated clearings have been made for grassland or small berry fruit patches. Today this is often a zone of abandonment with the pasture invaded by bracken, blackberries and regrowth woodland, only kept at bay by the grazing of small numbers of beef and dairy cattle. The forested stretches are utilised to a minor degree as 'bush runs' or rough pasture.

The land use pattern in the north consists primarily of a number of scattered blocks of intensive orchard land use separated by large tracts of grassland or woodland. (Fig. 15). The pattern of utilisation within the orchard units is a simple one of cultivated orchard blocks on suitable sloping sites and soils, interspersed by permanent grassland and some woodland. (Fig. 15). Other crops of some importance are fodder (hay) on the West and East Tamar, oats on the south eastern portion of the Tamar and potatoes and fodder at Lilydale.

III THE MARKETS

1. The Overseas Markets.

"The Tasmanian pome fruit industry was largely developed on overseas market possibilities and it is still very dependent upon these markets for the economic disposal of at least 3,000,000 bushels of the total apple and pear crop."¹ (Fig. 16). The principal overseas markets are in the United Kingdom and Western Europe, but small shipments are also made to Asia. (Fig. 17). In the overall marketing pattern the dominance of overseas shipments is striking, for an average of 65% of the apples and 77% of the pears go overseas. Among the Australian states Tasmania ranks first as an exporter of apples and is second only to Victoria for pears. In 1959, of the 4,718,763 cases of apples shipped from Australia, no less than 74% were from Tasmania; pear shipments totalled 1,118,000 cases of which 30% were Tasmanian.

The overseas export season is a short one of only 12 to 16 weeks, beginning in mid-February and ending early in June, with a peak in shipments in April and early May. (Fig. 18). During this period up to 30 overseas vessels are chartered to call at Tasmanian ports to load fruit in lots varying from 25,000 to 200,000 cases. The first cargoes arrive in Europe in April, after Canadian and United States apple exports have ended. Arrival of shipments reaches a peak in June and thereafter decline, finally ending early in August when home supplies begin.²

i) The United Kingdom market.

Since overseas shipments began in the late nineteenth century the United Kingdom has been by far the leading market

1 Walker, W.F., "The Selection and Presentation of Fruit for Export", reprint from the Tasmanian Journal of Agriculture, Vol. XXII, No. 1, 1951, p. 1.

2 Ross, A.D., "The Seasonality of Apple Supplies in the United Kingdom", Quarterly Review of Agricultural Economics, Vol. XIII, No. 1, 1960, p. 30.

MARKET OUTLETS FOR TASMANIAN APPLES - 1939, '43 & '56.

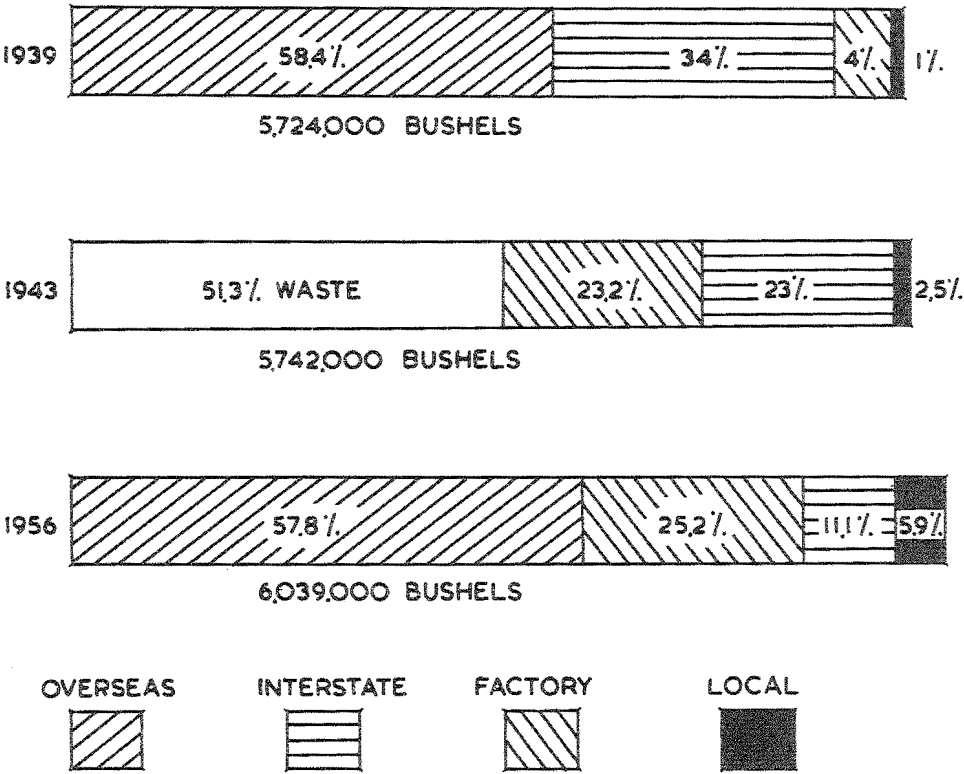


Fig. 16.

TASMANIAN EXPORTS OF APPLES & PEARS OVERSEAS. 1946 - 59.

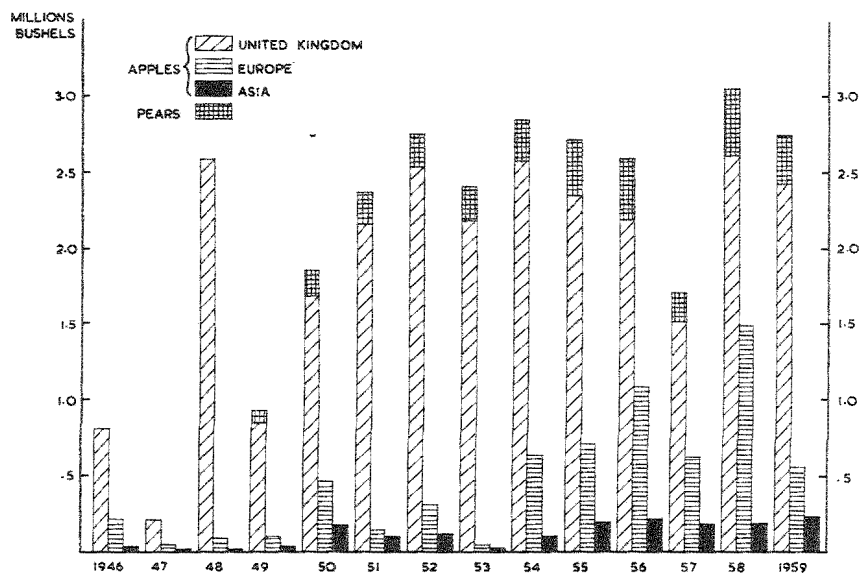
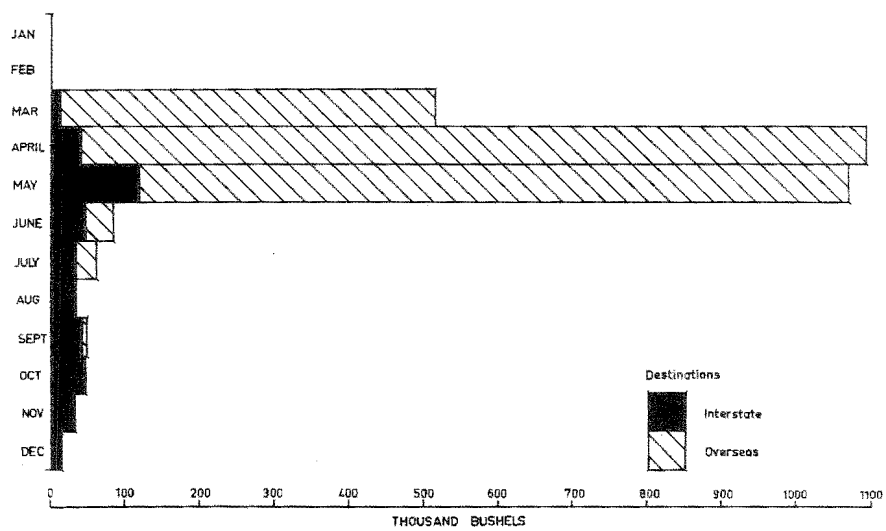


Fig. 17.



Monthly shipments of Tasmanian apples & pears, 1957

Fig. 18.

absorbing up to 50% of the Tasmanian apple crop³ and almost 80% of the pears. For instance, in 1960 the United Kingdom imported over 10,000,000 bushels of apples; 3,085,457 bushels of these came from Australia, of which 2,227,457 bushels or 74% were from Tasmania. Tasmanian overseas shipments of pears are entirely to the United Kingdom. In 1960 the United Kingdom imported 911,228 cases from Australia, of which Tasmania sent 326,751 cases or nearly 35%. Unlike apple exports which have been static in recent years, pear shipments have increased, from less than 200,000 cases in 1950, to average over 300,000 cases since 1955. (Fig. 17).

The United Kingdom receives a marked preference in shipments due to its longstanding position as the principal market outlet. This means the United Kingdom market is always fully supplied and total exports vary little, while exports to other outlets fluctuate according to the crop produced. In good seasons there is a danger of over supply and each grower is limited to an overseas quota of approximately 60% of his crop

ii) The Continental market.

The re-establishment of trade with Western Europe made a slow recovery after World War II. Most of Australia's prewar customers were more concerned with rehabilitation and could ill afford to divert currency to buy such a luxury article as fruit. Consequently small shipments were made to Sweden only. In 1950 Germany, the largest prewar importer, resumed imports and has re-emerged as the leading continental market. Belgium began re-importing Tasmanian apples in 1951 Norway in 1954 and the Netherlands in 1956. Considerable shipments have been made to Eire in 1949, 1950 and 1954 and

3 The Report of the Royal Commission on the Tasmanian Apple and Pear Industry in 1952 described the United Kingdom market as the 'corner stone' of the whole Tasmanian Industry, "Journals and Printed Papers of the Parliament of Tasmania", Vol. CXLVII, 1952, p. 7.

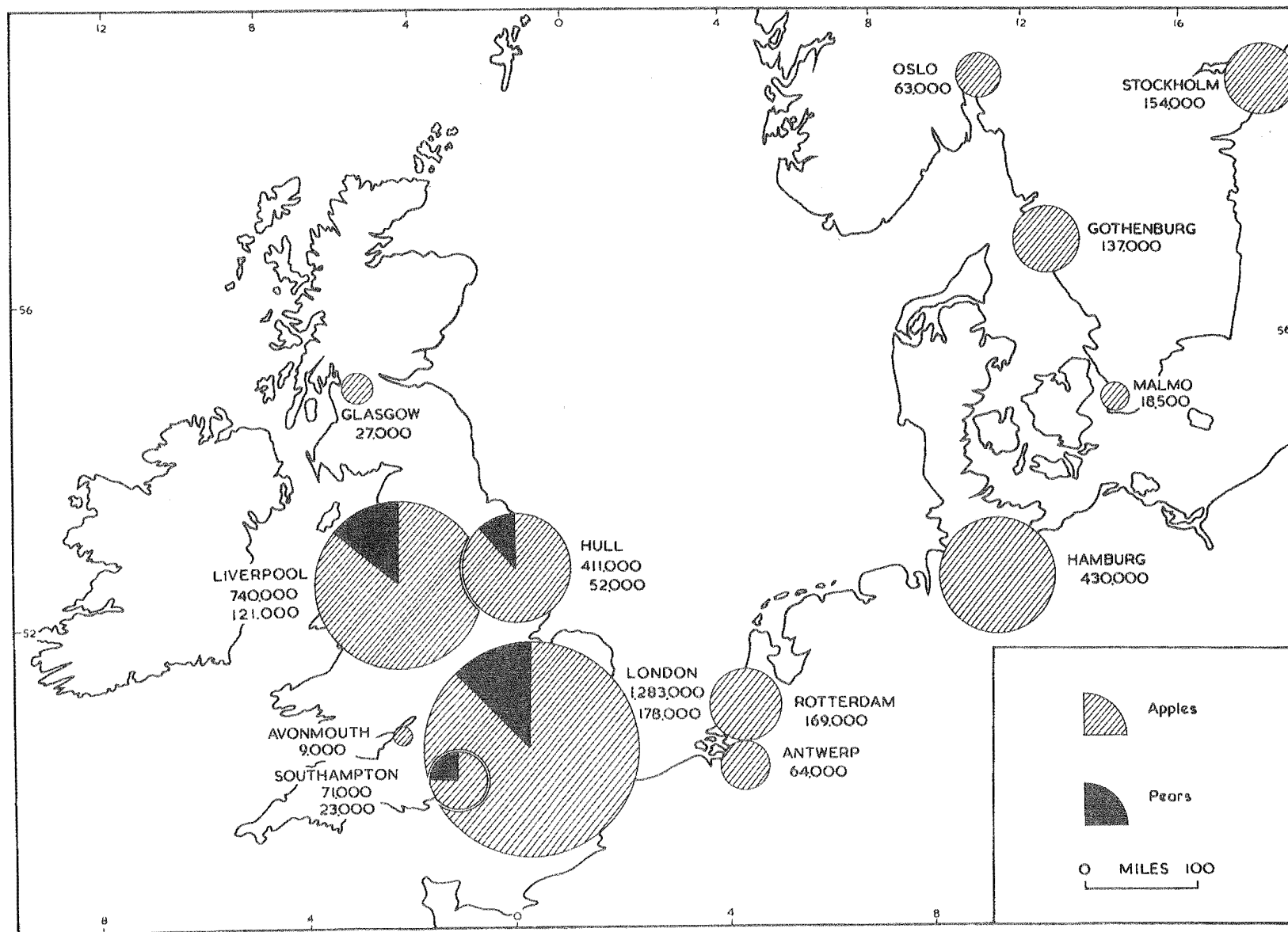


Fig. 19 Tasmanian Exports of Apples and Pears to Western Europe. Average Shipments, 1958-60.

to Finland in 1958.⁴ The continental fruit trade is almost wholly confined to apples with very occasional shipments of pears to Belgium and France.

The continental market ranks second after the United Kingdom and takes from 600,000 to over 1,000,000 bushels of apples or 15% to 30% of the Tasmanian overseas shipments. The large fluctuation in total imports is a feature of the continental trade, for example in 1953 Tasmania sent only 47,000 bushels, in 1958 - 1,484,953 bushels. This is due to the United Kingdom taking precedence in years of small crops such as in 1953. (Fig. 17). Germany is now firmly established as the leading importer (averaging 400,000 bushels between 1954 and 1960) but is closely followed by Sweden⁵ (250,000 bushels) who also re-exports to Norway and Finland. The Netherlands, Belgium and Norway take smaller amounts, varying from a few thousand to hundreds of thousands of cases. (Fig. 19).

iii) The Asian market.

Asia presents a vast potential market for Tasmanian fruit yet exports to this area are only small and do not exceed 200,000 bushels, or less than 6% of the overseas trade. (Fig. 17). The answer lies in the very low purchasing power of the Asian peoples to whom fruit is in the super luxury class. It is significant that trade with Asia is mainly confined to the large sea-port cities, Singapore, Bombay, Colombo and Hong Kong where per capita income is highest. Malaya and India are the largest Asian markets importing up to 100,000 cases per annum. Small quantities

4 Also fruit is transhipped from Liverpool to Eire and from Stockholm to Finland.

5 In 1960 Sweden introduced rigid inspection of Australian fruit to stop importation of fruit infested with San Jose scale and woolly aphis and some 50,000 cases of apples were rejected. 'The Tasmanian Farmer and Fruit Grower', Vol. 37, No. 443, 1960, p. 20.

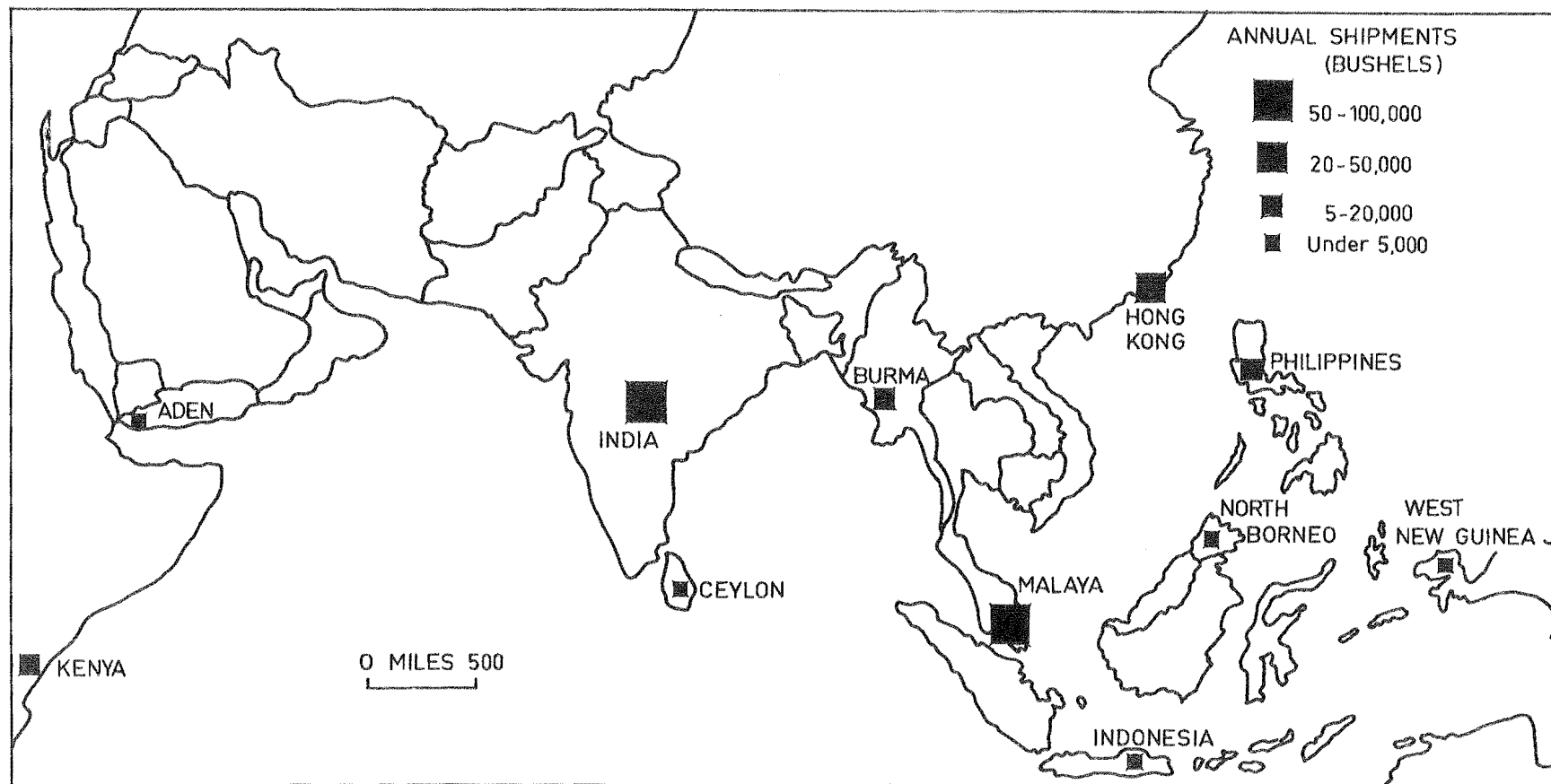


Fig. 20 Asian & African destinations of Tasmanian apples - Average shipments 1954 - '58

are sent in addition to Burma, the Philippines and irregular shipments of up to a few hundred cases are made to Indonesia, Dutch New Guinea and North Borneo. (Fig.19).

There is no definite fruit shipping season to the Asian market as for the United Kingdom and European markets. The fruit is usually carried by general cargo boats fitted with cool storage. Lots of a few hundred to several thousand cases are loaded at Tasmanian ports in conjunction with other cargoes. Shipments begin during the normal overseas shipping period but continue throughout the winter until October, drawing from supplies kept in cool store at the ports. Some Tasmanian fruit is also transhipped via mainland ports to the Asian markets. Small lots of apples, up to several hundred cases, are sent by interstate freighter and even by air to Melbourne, Sydney and Adelaide for transfer to Eastern bound freighters.

iv) Other overseas markets.

Outside the main trade pattern are a number of small markets to which irregular shipments are made. Small quantities of fruit are discharged at Aden by European bound freighters. A small trade in apples grew up with the West Indies from 1949 to 1953. In recent years apples have been sent to Kenya and Honolulu, but none of these outlets appear likely to be a permanent feature of the trade pattern.

2. The Interstate Market.

A peak of $2\frac{1}{2}$ million cases was reached in interstate shipments of apples and pears in 1940. Since then the shipments to the mainland have steadily declined to the present figure of under 500,000 cases or 10% of the total crop (1959 - 400,000 cases, 8.5%) so ranking third after the processing factories as a market outlet. (Fig.16). The decline has been especially marked in respect to pear shipments, for example in 1949, 150,000 cases were sent to the mainland, in 1958 a mere 3,000 cases were shipped. The biggest market

losses have been in Victoria (Melbourne) where local production has risen in recent years and periodic home shortages can be supplemented more cheaply by fruit brought by rail from South Australia.⁶ New South Wales (Sydney and Newcastle) has always been the leading importing state since commercial production began in Tasmania. Queensland (Brisbane) follows closely and is now the only other state to import Tasmanian fruit in quantity.

The bulk of the interstate shipments are made up of fruit sent straight from the orchard and coincide with the overseas shipping season. However, small cargoes continue to be sent from cool stores throughout the year until early in January and the commencement of the new fruit season.⁷ The fruit is carried by small interstate freighters which lack the specialised facilities used in the larger overseas boats. In addition sailings are irregular and intermittent and the fruit often arrives in poorer condition than when transported to Europe.⁸ This reflects the prevailing lack of regard for the interstate market which is perhaps a legacy of the nineteenth century colonial fruit trade.

6 There has been a loss of prestige by Tasmanian fruit in recent years which is an important though intangible factor contributing to the decline. Also regulations governing the entry of Tasmanian fruit infested with European red mite into Victoria are being strictly enforced and shipments have virtually ceased.

7 In 1958/59 there were 77 shipments to Sydney and Newcastle, 19 to Brisbane and 1 to Melbourne.

8 The introduction in 1959 of a drive on ferry now allows fruit to be transported direct from the orchard to the shop with a vast improvement in quality.

3. The Local Market.

With a population of only 350,000, Tasmania has a small home market for fresh fruit. Local demand absorbs as little as 300,000 to 400,000 bushels or 5% of the apple crop and a similar percentage of pears. (Table 27). It is hardly surprising that the local market is regarded as of little significance in comparison with overseas and even interstate outlets. In consequence the fruit sold locally is normally of either low grade quality and size or else of unwanted varieties that cannot be sent overseas; "The domestic market is the Cinderella of the industry. It is fed on the crumbs that fall from the table of the overseas and interstate consumers."⁹ In recent years a new marketing development has taken place, that of roadside sales by the case direct from the orchard. This is now common practice and is most popular in the northern producing areas, especially where orchards front onto a main road as along the West Tamar and at Spreyton on the Mersey.¹⁰ A large apple and pear crop can leave a considerable surplus of inferior quality fruit after all market requirements have been satisfied, for example in 1957 200,000 cases of apples and 15,000 cases of pears were classified as waste. Some of this surplus production can be utilised to some extent as supplementary feed for livestock or as a bait for rabbit poison.

9 The Royal Commission on the Tasmanian Apple and Pear Industry, op. cit., p. 83.

10 It is estimated that the orchardists in the Spreyton district sell 70,000 to 80,000 cases locally, mostly by roadside sales, this is over 40% of the local crop.

"The Tasmanian Farmer and Fruitgrower", December, 1959.

Table 27

Marketing Pattern of the Tasmanian Apple Crop 1954-60 (Bushels)

Markets	1954	1955	1956	1957	1958	1959	1960
Overseas	3,435,000	3,249,000	3,492,000	2,287,000	4,388,000	3,472,000	3,644,000
Exports	64.8%	64.6%	57.8%	67.2%	66.5%	69.7%	66.6%
Interstate	277,000	626,000	670,000	390,000	633,000	400,000	356,000
Exports	5.2%	12.6%	11.1%	11.5%	9.5%	8%	6.5%
Used in	1,318,000	865,000	1,521,000	528,000	1,218,000	826,000	1,098,000
Factories	24.8%	18.3%	25.2%	15.5%	18.3%	16.6%	20.1%
Local Markets and waste	274,000	269,000	356,000	196,000	402,000	285,000	375,000
	5.2%	4.8%	5.9%	5.8%	6.1%	5.7%	6.8%
Total Crop	5,304,000	5,009,000	6,039,000	5,401,000	6,641,000	4,983,000	5,473,000
Value	£4,715,000	£4,851,000	£5,385,000	£3,818,000	£7,164,000	£4,904,000	£5,145,000

Table 28

Marketing Pattern of the Tasmanian Pear Crop 1954-59 (Bushels)

Markets	1954	1955	1956	1957	1958	1959
Overseas	281,000	361,000	408,000	193,000	440,000	326,000
Exports	73.8%	84.1%	76%	67%	83%	77.4%
Interstate	16,000	21,000	20,000	4,000	3,000	3,000
Exports	4.2%	5%	3.8%	1.4%	5%	6%
Used in	54,000	45,000	71,000	43,000	74,000	62,000
Factories	14%	10.4%	13.2%	15%	14%	14.6%
Local Markets and waste	36,000	-	38,000	47,000	13,000	30,000
	8%	-	7%	16.6%	2.5%	7.4%
Total Crop	387,000	427,000	537,000	287,000	530,000	421,000
Value	£416,000	£498,000	£611,000	£357,000	£933,000	£513,780

4 Ports of Destination.

The Tasmanian fruit shipped to Western Europe is imported through only a small number of ports due to the need for specialised facilities in handling this perishable cargo. In the United Kingdom five ports handle the bulk of the fruit imports; London, Liverpool, Hull, Southampton and Glasgow, though small amounts may also be landed at Avonmouth. (Fig. 19). London, with its long established and complex marketing organisation was the first port to receive Tasmanian fruit and has been the focal point of the trade ever since. Over 1,000,000 cases of Tasmanian apples and most of the pears are imported through London to supply the largest single consumer market in Britain. Liverpool and Hull together account for a further 1,000,000 cases of apples and the remainder of the pears. These two ports serve the northern industrial areas of Lancashire and the West Riding of Yorkshire. Southampton and Glasgow import 50,000 to 100,000 cases of apples and so rank well below the three major ports. Most of the apple boats call at more than one port, some also proceed to the continent after unloading part of their cargo at the British ports. Fruit in small quantities is transhipped to the continent from the Humber ports and to the Irish ports of Dublin and Belfast from Liverpool.

On the European continent Germany's imports go entirely through Hamburg, Sweden's through two major ports, Gottenburg and Stockholm and occasionally through Malmo. Some of this fruit is re-exported to Norway and Finland. Oslo handles Norway's fruit imports, Antwerp those of Belgium, and Rotterdam those of the Netherlands. (Fig. 19).

5. The Ports of Despatch.

The overseas fruit export trade is largely in the hands of Tasmania's chief port Hobart, which ships three-fifths of the fruit sent overseas. Three other ports, Port

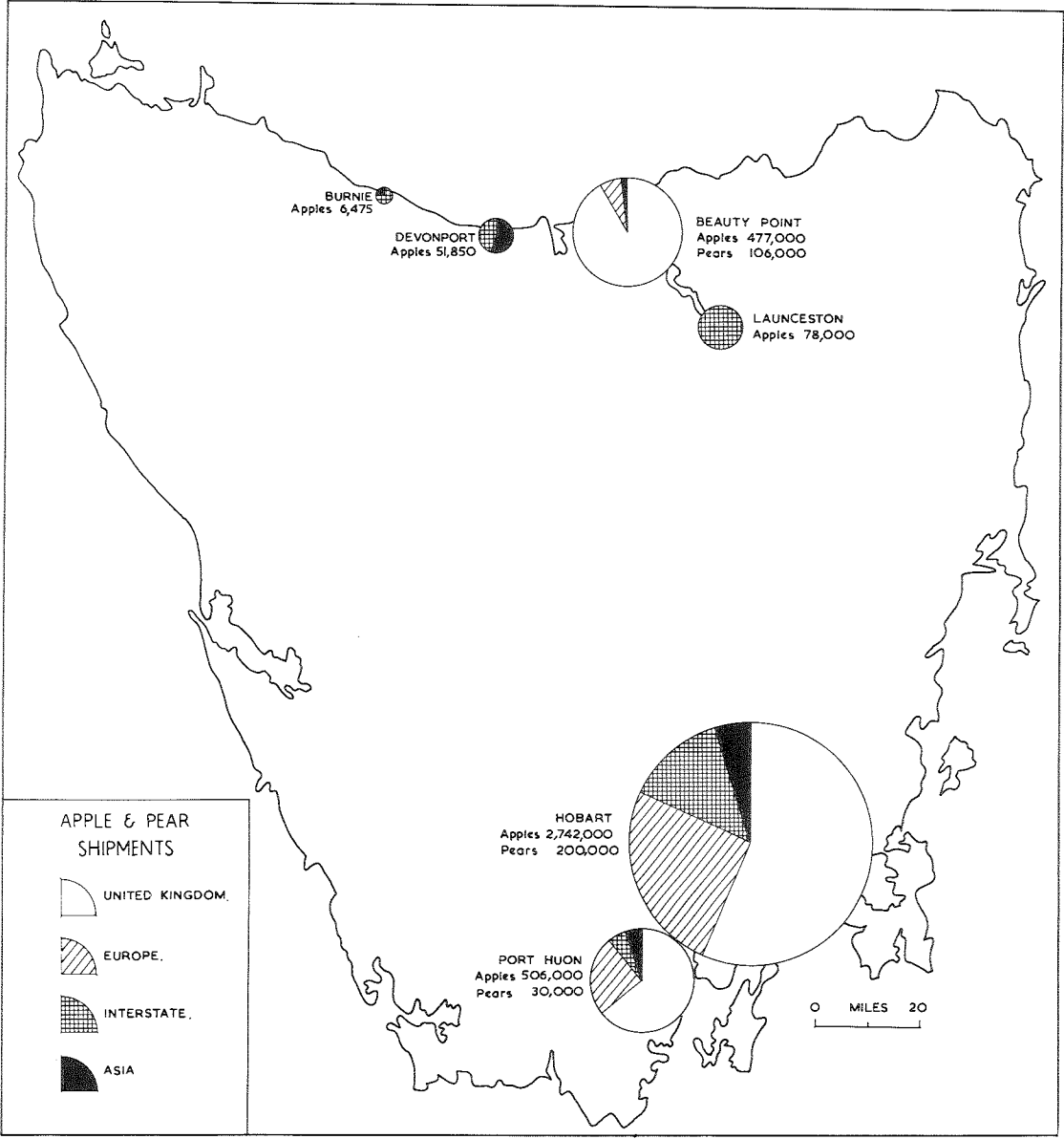


Fig. 21. Destinations of Apple and Pear Exports from Tasmanian Ports - Average Shipments 1954 - 1958.

Huon, Beauty Point and Devonport handle the remaining two-fifths. From Hobart fruit is shipped to all the overseas markets but more especially to the United Kingdom and Europe. Since 1953 the re-opening of Port Huon at the mouth of the Kermandie River has provided a more direct outlet for the main areas of production in the Huon Valley. This has eased the congestion at Hobart in the short, crowded shipping season. The northern orchard areas of the Tamar and Mersey Valleys are served by the deep water wharf constructed at Beauty Point at the mouth of the Tamar.¹¹ Devonport at the mouth of the Mersey ships fruit exclusively to the Eastern markets.¹² (Fig. 21).

Interstate shipments now go primarily to Sydney, Newcastle and Brisbane and as many as seven Tasmanian ports take part in this trade. (Fig. 21). Hobart leads in shipping up to 75% of the total. Launceston follows with 15%, for the small interstate freighters can navigate the shallow Tamar. The remainder goes through a number of ports scattered along the North-West Coast, Devonport, Burnie, Ulverstone and Stanley. Devonport and Burnie have regular trade connections but shipments from Ulverstone and Stanley are small and intermittent and these two ports are remote from the northern centres of production. Port Cygnet in the south played a large part in the interstate trade until its wharf was closed down in 1951, in some years even surpassing shipments through Hobart. The newly opened wharf at Port Huon has taken its place to some degree but does not send regular shipments interstate.

The overall dominance of the fruit shipments by Hobart is striking and is due to its splendid natural advantages of an excellent deep water harbour, proximity to the

11 Many fruit boats call at Beauty Point before proceeding to Hobart, this is because harvesting begins 8 to 10 days earlier in northern orchards.

12 Rare shipments are also made from Burnie and Launceston.

main centres of production and its long standing association with the export trade.

6. Transport to the Ports.

The revolution in form of transport of fruit from the producing areas to the ports is now complete. Motor transport began early in the 1920's and by 1939 50% of the fruit was carried in this way. Today water transport has ceased entirely, and over 97% of the fruit is conveyed by road, employing over 200 trucks in the overseas shipping period. Road transport has the great advantage of providing the grower with direct contact with the port, as well as flexibility, a minimum of handling and cheapness.

Transport costs are assessed by distance, which naturally favour those orchard areas nearest to Hobart, Port Huon and Beauty Point. An economic distance has been estimated as from 25 to 30 miles at a cost of 10d. per case.¹³ Thus the upper Huon Valley, D'Entrecasteaux Channel and Derwent Valley are within economic distance of Hobart. But the out-lying areas of production in the south at Triabunna, Tasman Peninsula and Bruny Island are at a considerable disadvantage.¹⁴ The lower Huon is well placed now that a deep water wharf has been constructed at Port Huon. In the north the West Tamar orchards are close to the overseas wharf at Beauty Point but the East Tamar is handicapped by lack of a bridge over the lower Tamar. The growers in the Mersey Valley are at the greatest disadvantage, though near to Devonport, this port is not used during the main overseas shipping period and fruit has to be road freighted over poor roads to Beauty Point at the high cost of 1/4d. per case. Pears for canning have the longest hauls of all now that the only canning factories are

13 Inglis, I.G., and Fergusson, D.J., op. cit., p. 9.

14 Both as to costs - as high as 1/3d. a case - and poor gravel roads which cause damage to the packed fruit.



Photo. 13.

Consignments of export apples awaiting government inspection prior to shipment overseas.

Photo. 14.

Long lines of waiting apple lorries are a familiar sight on the Hobart waterfront from March to May.



Photo. 15.

Palletised loading of apples onto an overseas freighter. The recent introduction of bulk handling methods has done much to speed up loading in the short overseas shipping period.

110.

at Hobart. Approximately a third of the pears processed are grown on the Tamar and are transported over 150 miles by road and rail.¹⁵

7. Fruit Presentation.

The presentation and packing of apples and pears for the overseas market is an important and costly item. Many growers prefer to send their fruit to large central packing sheds run on co-operative or commercial lines and which are situated in the main producing areas or at the export outlets. However, almost 50% of the fruit is still packed in small packing sheds on the individual orchard properties. Since there is no unanimity amongst growers as to stage of ripeness at the time of packing for maximum storage life, this inevitably leads to a great variation in standards and to excessive numbers of brands on the market.

The northern orchardist more especially on the Mersey and West Tamar, predominantly makes use of large scale facilities available at the ports of Beauty Point and Launceston or in the producing areas. In the south the reverse is true of the main producing area in the Huon. Here over half the growers pack on their own holdings, those with large productions, 10,000 cases or more, exclusively so. Smaller producers either make use of their neighbours facilities or send their fruit to the large packing sheds in the main centres of Huonville, Cygnet, Geeveston and Dover. From the D'Entrecasteaux Channel much of the fruit is sent to nearby Hobart to be packed. Growers on the Tasman Peninsula make use of a central packing shed at Premaydena.

Provision of cool store facilities which are essential for fruit going to the Asian, interstate and local markets are

15 Until 1956 all pears were transported by rail, but the high percentage of damaged fruit has resulted in a change to road transport.

beyond the resources of all but large producers.¹⁶ Several hundred thousand cases have to be stored after harvesting ends in May, some for periods of up to seven months. Ideally the majority of the fruit is stored at the ports, Hobart, Launceston and Devonport. Cool stores also cater for fruit awaiting shipment to Europe and the United Kingdom, for the pre-cooling of pears prior to shipment and for retaining small quantities of apples and pears for the local market.

8. Market Trends.

The disrupting effects of World War II have now wholly disappeared and a normal pattern of trade has been re-established. Many of the trends in this pattern, such as declining demand and increasing competition, which were becoming evident before the war, have now reached a critical stage. This is especially true of the main markets in the United Kingdom and Europe. The factors behind this shrinkage of markets would seem to be:-

1. The increase in home production in the European countries. For example the United Kingdom now produces over 20,000,000 bushels of apples per year or 80% of home demand which is twice prewar figures. Pear production has also risen and can satisfy 45% of home demand (20% prewar).¹⁷ As a consequence of increased home production apple imports have decreased, in the case of the United Kingdom from 16,000,000 bushels prewar to some 9,000,000 bushels today.¹⁸

2. Competition for this limited market has grown in recent years, notably from South Africa. Fruit from South Africa is in direct competition with Tasmanian arrivals in April and May

16 Though more are being built on the orchards.

17 Honan, N.D., 'The United Kingdom Apple Market', Quarterly Review of Agricultural Economics, Vol. IX, No. 3, 1956, p148.

18 The full implications of this fall in the level of apple imports has been cushioned by the big drop in exports from the U.S.A. and Canada due to dollar restrictions.

and her exports are increasing yearly. Apple production is expanding rapidly in South Africa and in fact increased between 1953 and 1960 from 409,000 to 5,000,000 cases.¹⁹ Also South Africa possesses a number of advantages over Tasmania; her freight costs are lower by over 5/- per case, the fruit arrives in a better condition due to a shorter sea voyage and to pre-cooling before shipment.²⁰ Labour is both plentiful and cheap and her marketing organisation, in the hands of one central authority, achieves greater co-ordination than is possible in Tasmania with a large number of shipping agencies.²¹

Nor is competition on the United Kingdom market limited to South Africa. A number of other Southern Hemisphere countries have made large plantings of apple trees since the war and all look to the United Kingdom as the world's major market. Argentine, Chile, New Zealand and the other Australian states are all stepping up their exports of apples and pears. With improved gas cool storage facilities European producers are now able to supply fresh fruit almost the whole year and large producers such as Italy are exporting increasing amounts in the 'off' season. The seasonal advantages held by Southern Hemisphere producers are steadily diminishing.

3. There has been only a slight increase in apple consumption in Britain which is now only 28 lbs. per head²²

(Germany 54 lbs. is the highest). Citrus fruits are more favoured while the high price of imported apples raises them into the luxury class in the average family budget.

4. Tasmanian growers have experienced an all round rise in costs of production, presentation and freight, while selling

19 Crop potential of 13 million by 1970, 8 million for export, Ross, A.D., op. cit., p. 29.

20 Though Tasmanian pears are now pre-cooled before shipment.

21 Honan, N.D., op. cit., p. 148.

22 Ross, A.D., op. cit., p. 28.

prices have remained stable or have fallen.

5. The absence of a home market and the sharp fall in interstate shipments²³ completes an unsettled outlook for the Tasmanian grower.

These trends have been experienced by growers in western North America for a number of years and similarly to Tasmania, "changing geographical factors are not primarily responsible for the crisis in the industry. The causes are economic and their origin is to be found in a changed competitive situation in the distant market areas."²⁴ The present markets appear to have reached saturation point. In the western United States rationalisation and the elimination of marginal and uneconomic orchards has taken place. In Tasmania the same contraction is taking place and seems likely to continue.

If the Tasmanian industry is to survive on its present scale, consumer demand must expand and new market outlets will have to be found. Many potential markets exist in South-East Asia but the very limited purchasing powers of these countries must bar any hope of a dramatic market expansion in the foreseeable future.

The following quotation sums up the present marketing

23 But some growers believe prospects on the interstate market will improve; population is increasing but production on the mainland is static and big improvements in transport are taking place, for example the new drive on ferry reduces handling to a minimum and the completion of a standard gauge railway from Melbourne to Sydney - this will of course favour northern orchardists.

24 Lemon, H., and Towsley, R.C., 'The Washington Apple Industry', Economic Geography, Vol. 21, 1945, p. 182.

situation, "The European markets are supplied not only by Australia, but by the U.S.A. and Canada, as well as other Southern Hemisphere countries, such as Argentina, New Zealand and South Africa. Furthermore future competition will also be more intensified from the English apple industry where recent developments in production efficiency, packing and fruit preservation has prolonged the marketing season of local supplies. The English apple crop does exceed the 20,000,000 bushel mark and some growers are already considering export markets."²⁵

8. The Market Preferences for Different Varieties of Fruit.

The multiplicity of varieties is a marked weakness of the Tasmanian export trade and Tasmania sends a great number of varieties (over 30) to the United Kingdom, more than any other producer. Also the majority of these varieties are of necessity mid-season or late maturing, since these have the best keeping qualities²⁶ essential for the long period of shipment.²⁷ The earliest maturing variety, the Worcester Pearmain, makes up only 1% of the crop but is potentially a best seller.

The introduction of a new variety is a slow process, "It is said to take a dozen years before a new variety can be so popularised that it can be asked for by name."²⁸ The United Kingdom importer, dealer or wholesaler requires a variety of which he has experience in handling and there is a strong

25 Walker, W.F., op. cit., p. 1.

26 Apples do vary from year to year in both eating quality and keeping quality, depending on seasonal climatic conditions.

27 In 1934 grading for colour was introduced, this has favoured the coloured varieties and many of the non-coloured have now virtually disappeared, for example the French Crab.

28 Stamp, L.D., 'The Land of Britain - Its Uses and Misuses', London, 1948, p. 110.

preference for global varieties such as the Jonathon, which is imported from the U.S.A., Canada, New Zealand, South Africa, Italy and the Netherlands.

There is a distinct pattern of market distribution in the varieties of apples. A wide range of varieties are shipped to the United Kingdom the leading ones being, Sturmer, Jonathon, Democrat, Cleopatra, Granny Smith, Delicious, Cox's Orange Pippin, Scarlets and Red Jonathons. Red varieties are most popular as colour is usually associated with flavour. Tastes do vary somewhat within Britain. For instance in northern England the preference is for an acid flavoured apple of larger size, in the south the softer, sweeter and smaller fruit are most popular, while the Glasgow market favours the large red varieties such as the Democrat.

The continental market will only accept a limited range of the well known varieties. The Scandinavian countries have a marked preference for the green and yellow varieties, for instance the Granny Smith, Cleopatra and Sturmer. Germany, the Netherlands and Belgium import mainly coloured varieties, for example, Jonathon, Red Jonathon and Democrat, but in recent years the green varieties have gained a strong footing, such as the Granny Smith²⁹ and Cleopatra.

The Democrat is the most popular apple in the Asian markets and the larger sizes which are unacceptable in Europe are well received. Malaya stands out as an exception to this rule where a green variety, the Granny Smith is highly regarded. But no Asian country takes more than six different varieties since Asia is a small and very selective market.

The lack of regard many Tasmanian growers have for the interstate market is well illustrated by the fact that no less than 40 varieties of apples are regularly shipped. The

29 This apple has been popularised by large imports from Argentina, 'The Tasmanian Farmer and Fruit Grower', November, 1959.

red and late maturing varieties predominate; the Democrat, Crofton, Jonathon and Delicious, the Democrat being a particularly popular apple on the Sydney market.

The number of varieties of pears grown is far more limited, less than a dozen are of commercial value. The William's Bon Chretien is grown solely for canning, under the trade name of Bartlett. The only important outlet for dessert pears today is the United Kingdom where all the main Tasmanian varieties, such as Winter Cole, Packham's Triumph, Buerre Bosc, Comice and Glou Morceau are well received. Moreover less distinction in variety is made by the consumer than is the case with apples.

9. The Organisation of Marketing.

Tasmania as a pioneer in the field of fresh fruit exports is handicapped by the accumulation of earlier errors. Market development has been haphazard, displaying little of the co-ordination in standards and policy of her followers and present Southern Hemisphere rivals; South Africa, Argentina and New Zealand.

Since Tasmania is not on a main trade route and the export fruit has to go to a market a great distance away, the shipping programme is especially organised³⁰ and compressed into as short a period as possible (the average season is 13 weeks). The overseas marketing system is in the hands of no less than three bodies. Firstly 18 fruit agents who arrange for the apportionment of overseas freight space between the 1,200 growers and handle the actual buying and selling of the fruit. These agents through local representatives canvass amongst the growers and arrange sales under the following

30 Six of the leading agents combine to form the Tasmanian Fruit Shipping Agents Committee. This body forecasts and books shipping space allotting the space to growers - usually some 60% of the individual crop.

conditions:-

1. Free Consignments - (1957 - 25.5%). The grower depends on ruling prices on arrival at the market and receives no advance payments from the agents.
2. Advance Accommodation or Guaranteed Consignments - (24.2%). The agent makes an advance which can be reclaimed if prices fall.
3. Guaranteed Advance - (50.3%). Where the grower is paid by the agent for his fruit as it arrives on the wharf at a Tasmanian port.

The growers' interests in this sphere are represented by the State Fruit Board - an elected body of producers. The third of the controlling bodies is the Australian Apple and Pear Board³¹ which is a voluntary association of producers and exporters whose task is to restrict total Commonwealth fruit exports to an economic level, to allocate a quota to the individual states and grant licences to the exporting agents.

No other fruit exporting country so lacks an overall marketing organisation or suffers from such a multiplicity of agents' brands and standards.³² This puts Tasmanian fruit at a grave disadvantage in competing with other producers, particularly South Africa, who has one marketing body, one marketing

31 Working through a further committee - the Overseas Shipping Representatives Association - arrangements are made with the shipowners for the tonnage of shipping required.

32 In 1939 there were no less than 2,000 different brands on the interstate market. Parsons, A.R., 'The Marketing of Tasmanian Apples and Pears and Potatoes', Department of Economics and Commerce, University of Tasmania, 1946, p. 19.

scheme and complete standardisation of quality and prices.³³

This legacy of pioneer conditions and interstate rivalries is still proving a handicap to the industry as a whole and must be reckoned as a major factor in the present rather gloomy market trends.

10. The By-product Industries.

The processing of fruit had begun in the early nineteenth century³⁴ and as early as 1842 there is evidence of exports to the Australian colonies.³⁵ Throughout the century there was a small but flourishing trade in jams and preserves with the mainland, the Pacific Islands and even as far afield as Europe and the United States. Apples were, however, one of many types of fruit used and it is impossible to evaluate their actual significance.

Today apples and pears are processed on a large scale, apples by canning and evaporating and pears by canning only. The evaporating industry began in the late nineteenth century, initially in the Huon Valley at Huonville, Franklin, Cygnet and Ranelagh. At this time the disease black spot was causing extensive damage to apples leaving the fruit too badly marked to sell. The evaporating works provided a market for this fruit. The newly established industry received a boost in 1901 when interstate duties³⁶ came to an end with the creation of the Commonwealth.

33 Though all Tasmanian exports are subject to State Government examination at the wharf to ensure correct packing and condition of the fruit. The State Agricultural Department also issues instructions on standards of quality and standardised packs.

34 Cider making is recorded in the late 1820's, "The Colonial Times", 3rd July, 1829.

35 Three barrels of dried apples were sent to Sydney in 1842, "The Hobart Town Courier", 3rd May, 1842.

36 The duties on jams and preserved fruits were particularly heavy.

The processing industry grew steadily in the inter-war period absorbing surplus fruit left over from the overseas and interstate market (usually from 5% - 10% of the total crop). The markets for dried apples were in the inland country districts of Queensland, New South Wales and Victoria where fresh fruit was unobtainable. Canned apples were of increasing importance both interstate and in the United Kingdom.

Under the stimulus of war-time needs and the complete cessation of overseas shipments, apple processing increased enormously. In 1944 2 million bushels of apples were processed or some 25% of the crop. The present average is 1 million bushels which is 20% of the total crop (1960 1,098,000 bushels, 20.1%). (Fig. 16). The processing factories now rank second after the overseas markets as an outlet for fresh fruit. The major role of the factory is to allow the grower to dispose of small or blemished fruit (especially hail damaged) or surplus production, though at prices well below costs of production. The pattern of production has changed somewhat compared with the inter-war period; the canned product has grown steadily more important and now dominates production, while evaporated apples are no longer in much demand. The solid apple pack or canned apple is sold chiefly on the mainland with a small surplus available for overseas markets in the United Kingdom and Canada. Evaporated apples are largely exported to the United Kingdom. The total value of the two products averages over £1,000,000 annually, £900,000 for canned apples and over £100,000 for evaporated.

Pear canning is limited to one variety, the William's Bon Chretien³⁷ which is processed and marketed under the trade

37 Very small amounts of one other variety, the Keiffer are also canned.

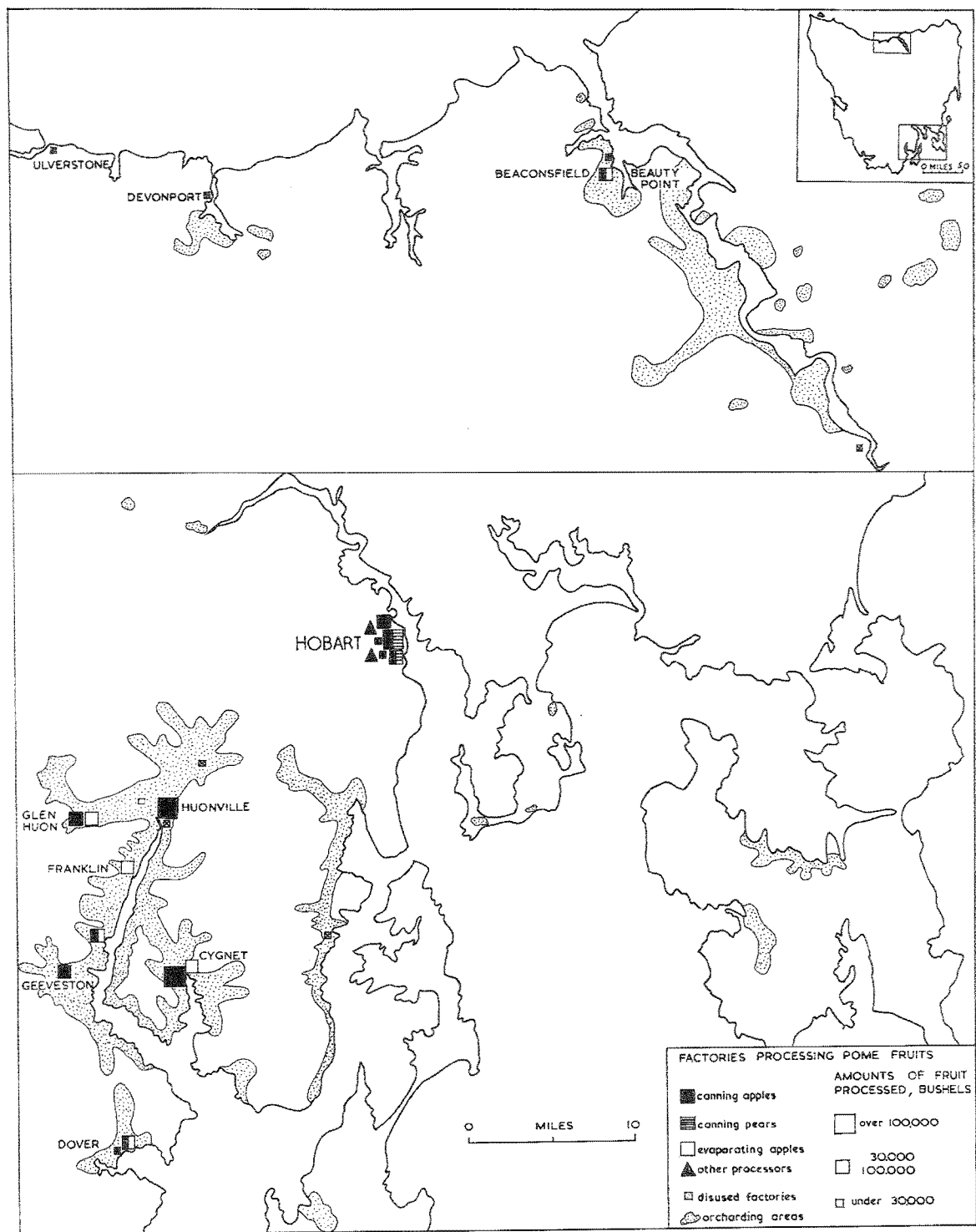


Fig. 22. Distribution of Factories Processing Pome Fruits.

name Bartlett. Processing takes place in February and March, filling the gap between the soft fruits and apples. The total amount of fruit involved varies from 50,000 - 75,000 bushels or some 10% - 15% of the pear crop. Pears are processed exclusively in Hobart³⁸ and supplies are brought in by road and rail from the Derwent Valley, South Arm, Tasman Peninsula, Triabunna and from the state's major area of pear production on the West Tamar, 150 miles away.³⁹

The apple processing season begins late in March and lasts from 8 - 14 weeks according to the crop. The chief varieties of apples required for processing are, the Sturmer Pippin, Jonathon, Granny Smith, Alfriston, Cleopatra and Democrat, although all varieties are used when supply is short.

The processing factories are sited in three main localities. One large group is situated in the larger urban centres in the main growing areas, at Huonville, Cygnet, Franklin, Dover, Geeveston and Glen Huon in the Huon Valley and at Beaconsfield and Beauty Point on the West Tamar. (Fig. 22). Fruit is supplied by growers within a radius of up to 10 miles, freight is a limiting factor as prices paid to growers do not cover the costs of production. This group of factories operate seasonally processing apples only, in addition all the evaporated apples are processed in the main growing areas. The temporary female labour comes from the families of the growers.

Another important group of processors are located at Hobart. This situation has the advantage of a good supply of seasonal labour, a local market, export facilities and the already established capital equipment. These firms operate the whole year round with apples being only one of many types

38 Now that a small canning factory has closed down at Beaconsfield on the West Tamar.

39 Until 1956 rail transport was used but growers have now mainly switched to road.

of fruit processed. Raw materials have to be transported further than for the first group but overhead costs of equipment and operating are lower. Hobart is also the centre of a number of subsidiary processes using apples, for example cider, fruit juices, apple vinegar, apple jams and jellies. (Fig. 22).

The third group located on the north-west coast is of minor importance. Here apples are canned as a sideline by large plants specialising in vegetable processing. Output is limited by the lack of supplies of suitable apples as the adjacent growing area on the Mersey is a small one and the Tamar is an uneconomical distance away.

11. The Allied Industries.

To produce fruit, package and present it, transport it to a port and ship it overseas requires a host of associate industries and services employing many thousands of people.⁴⁰ The supply of machinery, fertilisers and spray materials is needed in production; box milling and case making, wood wool, straw board, wrapping paper, stencils, labels, wire and nails for packaging and presentation; while road and rail transport, professional, commercial and financial services and wharf labour are necessary in overseas shipment. The "successful development and maintenance of a regional orchard speciality requires the expert attention of many people, not only farmers but also processors, packers, brokers, shippers, researchers, inspectors, labourers, banks and handlers of equipment and supplies."⁴¹

40 In a report on the 'Tasmanian Apple Industry' in 1936 by S.F. Limbrick and D.T. Lattin, it was estimated from 15,000 to 18,000 people were connected with the industry, of these 10,000 were directly engaged in production. The numbers are probably less today, for example there are now 1,631 growers compared with 2,473 in 1936.

41 Robertson, I.C., 'Ozark Orchard Centre of South Illinois', Economic Geography, Vol. 4, 1928, p. 268.

The production of fruit cases is the leading industry in this category, for upwards of 4,000,000 standard bushel cases worth over £500,000 are required annually for the export trade. The timber for the cases is cut in the forested country which surrounds the growing areas. (Fig. 23). The higher slopes and areas of plateau have a high rainfall and carry mixed stands of closed eucalypt forest. The best milling timbers are the stringy bark and swamp gum. The trees are cut and dressed in small local saw mills of which over a hundred are scattered over the southern region. (Fig. 23). These mills operate seasonally for up to 9 months of the year, production being limited by difficulty of access in the winter months and by growers delaying their orders until a crop is assured. The life expectancy of a case mill is short, over two thirds operate for less than 5 years. After the surrounding forest has been cut over the mill is moved to new stands and today the southern hills are dotted with the decaying remains of old case mills.

The major area of distribution is on the forested slopes and watershed areas close to the fruit growing areas (Fig. 23), for local contact between miller and fruit grower is an important consideration. But much of this area has now been cut over and only young regrowth timber much below the 3 feet girth limit remains. Consequently there is an increasing migration to the more distant upper reaches of the Huon River and its tributaries, such as the Dennison. (Fig. 23). Here virgin stands on crown land have been made accessible by roads built by the State Forestry Commission.⁴²

42 Information supplied by officers of the Forestry Commission and from a departmental report on the case milling industry entitled, "A survey of the productive capacity of the fruit case industry in relation to timber resources available in 1955 - 56, and in the future." October, 1955.

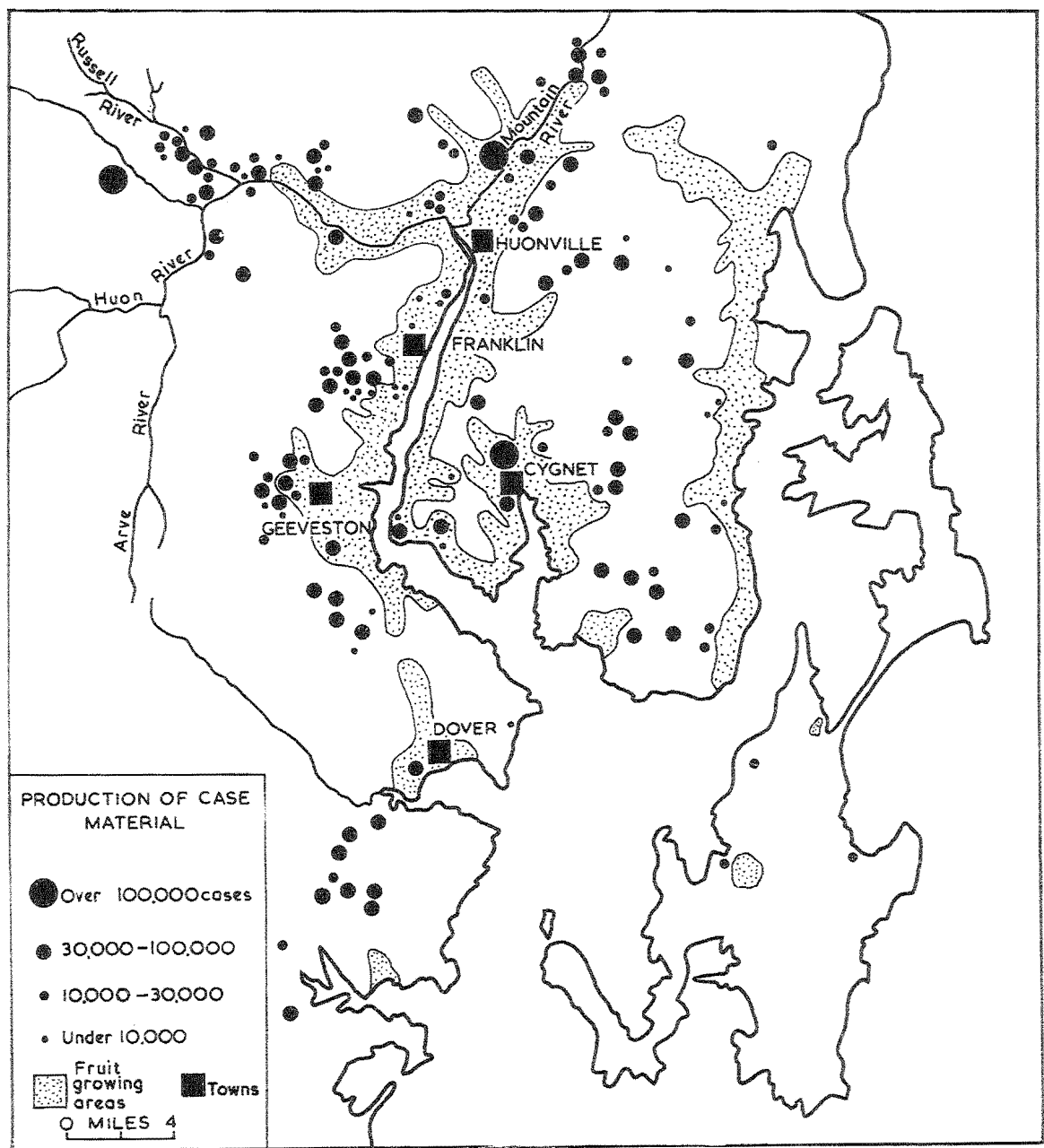


Fig. 23. Distribution of Sawmills Producing Fruit Case Materials, 1956.

Since many southern holdings have a large section of forest land, a few orchardists cut and dress their own box timber. More usually the case materials are brought ready cut from the local saw mill and the cases are made up on the orchard in the off season.

The northern pattern is a simpler one with fewer and larger case cutting concerns sited near government pine plantations as at Beaconsfield, Scottsdale and Railton. A large percentage of the cases used by northern orchardists are of dressed pine in contrast with the overwhelming use of hardwoods in the south.

The wide range of other allied industries and services are established in the large urban centres and ports of Hobart, Launceston and Devonport. It is a marked feature of the Tasmanian fruit industry that the services essential to the industry are not situated in the centres within the main areas of production, but some distance away in the large ports. For example, of the 18 large firms in the south connected with arranging overseas fruit sales, only two are established outside Hobart in the Huon Valley. There is evidence of some diversification in this sphere with the construction of a deepwater wharf at Port Huon in the heart of the main growing area, but Hobart appears unlikely to surrender its place as the commercial centre of the industry.

IV POPULATION AND SETTLEMENT IN THE ORCHARD REGIONS.

The orcharding districts of Tasmania have both a distinctive pattern and form of settlement and in the more important southern growing areas the highest densities of rural population in the state. This pattern is primarily attributable to the extremely intensive form of land use, the restricting physical conditions and to the historical sequence of occupancy. Significant regional differences occur in the north, where the restrictions imposed by physical controls on settlement and form of land use are less severe and the speculative origins of the orchard plantings has resulted in a scattered and less intensive distribution of orchard land.

1. Population.

i) Distribution.

In the southern orcharding regions of the Huon Valley, D'Entrecasteaux Channel and Tasman Peninsula, the distribution of population is markedly influenced by physical controls. Almost no settlement is to be found above a height of 1,000 feet and very little over 600 feet, while the 40 inch isohyet contains all the major settlements. Consequently settlement is largely confined to the gentle, lower coastal estuarine and river frontage slopes. Only where a river valley offers level terrain and good soils does settlement straggle inland for some distance, before finally petering out at the ends of the narrow, steep-sided valleys of the headwater tributaries. (Fig. 24). Behind this thin ribbon of coastal and valley settlement stretches a scarcely visited, inhospitable hinterland of rugged forested hills and mountains with a climate characterised by cool and changeable temperatures and excessive rainfall totals.

The northern orcharding regions which border the

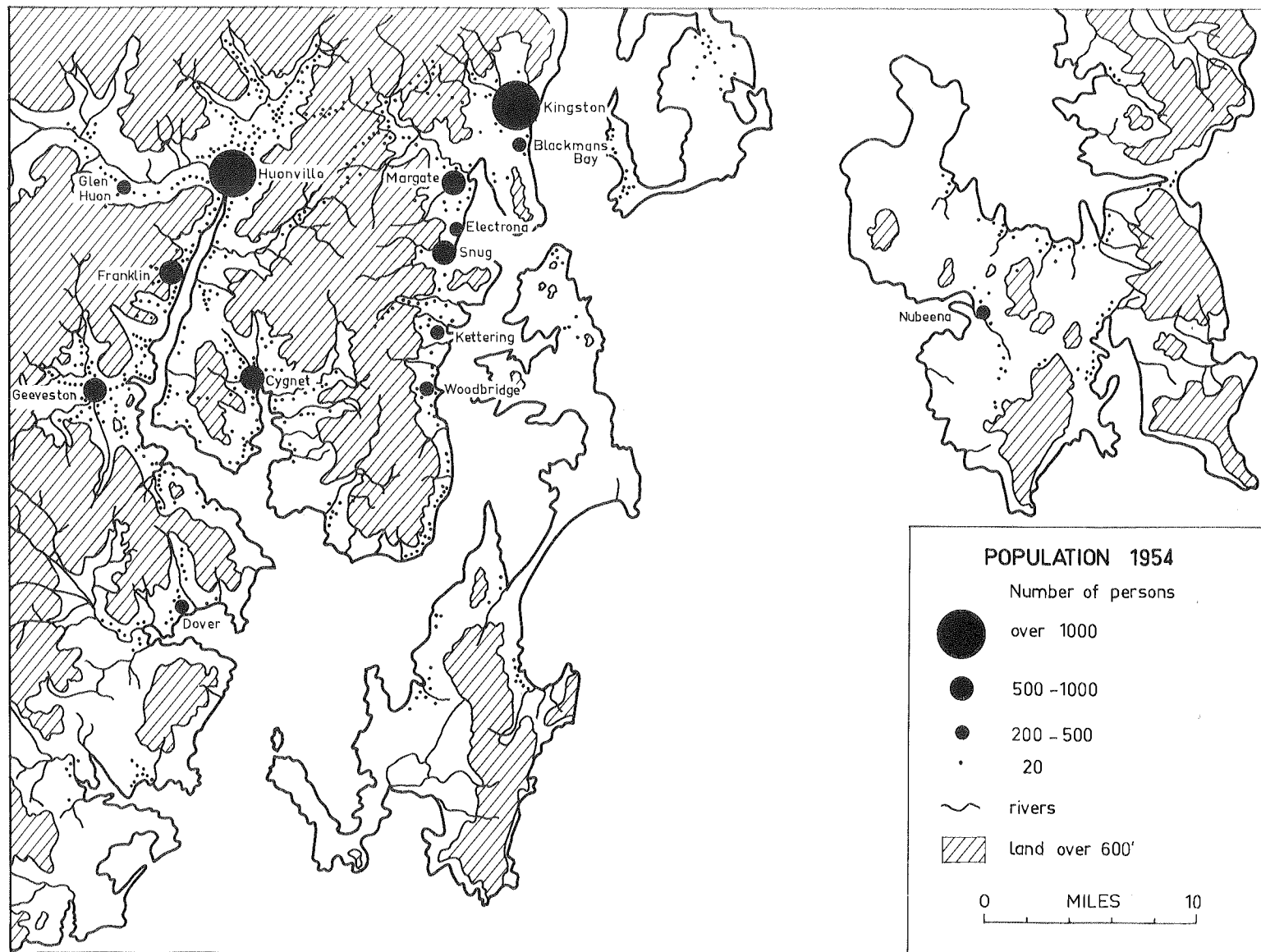


Fig. 24 Distribution of Population in Southern Tasmania. 1954

Tamar and the mouth of the Mersey are not subject to the same rigorous physical controls. Nevertheless there is a similar tendency for settlement to follow the river frontage or to cluster on patches of good soil and to be nowhere more than a few miles from a water frontage.

ii) Density.

Owing to the highly intensive form of land use and the small average size of farm holdings, the orcharding districts are characterised by very high densities of rural population. Average densities of from 50 to 100 occur in the south, more than twice the averages for other intensively farmed parts of the state, such as the dairying and potato growing region of the north-west coast. For example, the Geeveston and Franklin districts in the Huon Valley have 96 and 78 persons per square mile respectively. In the north the less continuous pattern of orchard land use and greater average size of orchard blocks and holdings is apparent in the lower population densities. For instance, Exeter on the West Tamar has an average density of only 23 persons per square mile.

The correlation between the density of population and the form and intensity of land use is well illustrated by plotting farm population against total acreage of agricultural land in police districts. (Fig. 25). The district where fruit production reaches its greatest intensity, at Franklin in the Huon Valley (where almost 50% of the total agricultural land is under tree fruits), has an average of only 4.4 acres per person, the highest density in the state.¹ The other southern districts range between 5 and 12 acres per person, with the area of greatest density of farm population closely correlating with the most intensive belt of orchard production lying across the mid-Huon Valley between Huonville and Geeveston.

1 Only the urban localities with intensive market gardening are as high.

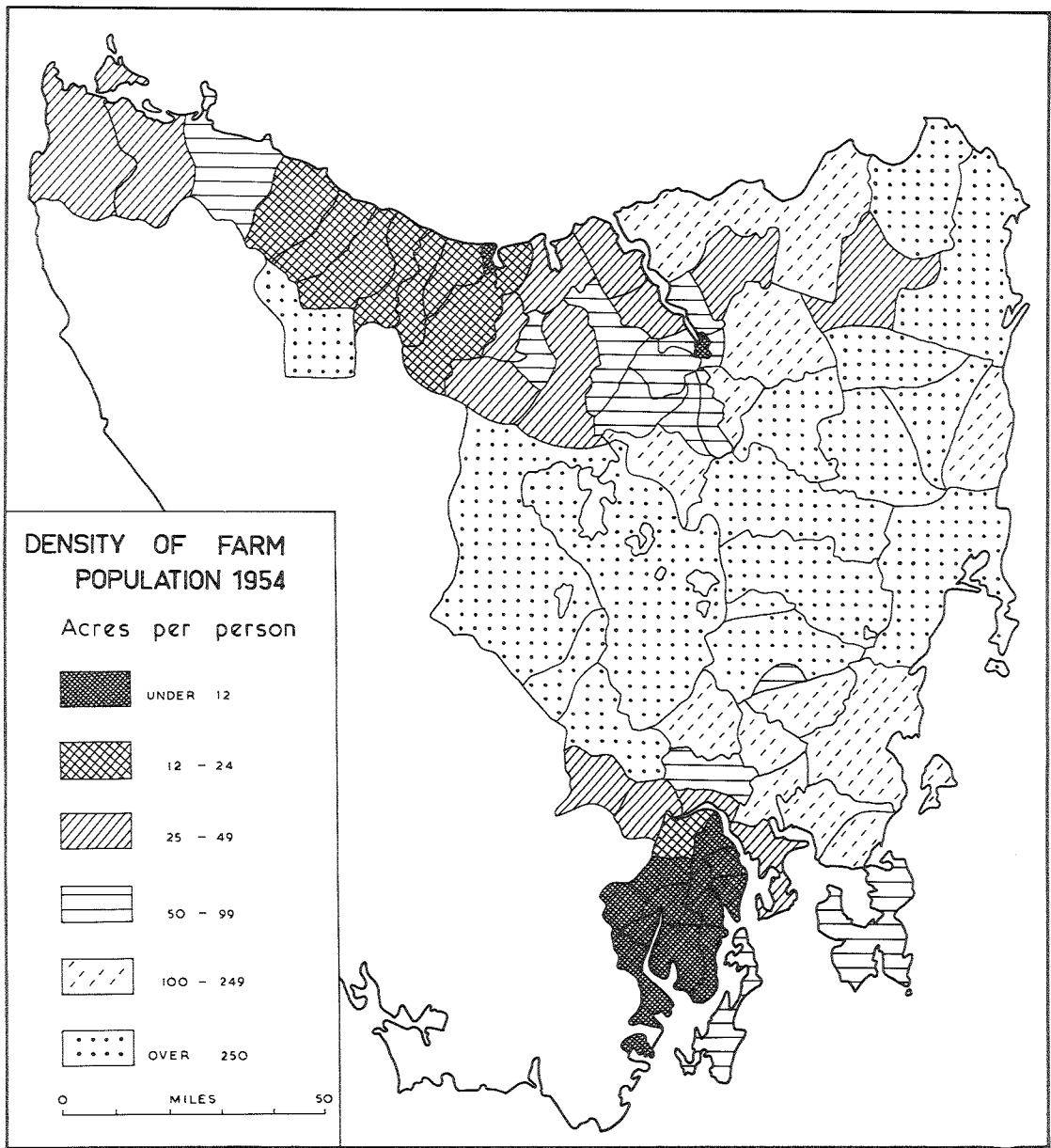


Fig. 25.

The Tamar orchard districts have densities of only one third of those attained in the south, for example Exeter has an average of 35 acres per person, a figure more comparable with the densities to be found along the intensively farmed north-west coast. Only at Latrobe in the north-west with an average of 14 acres per person, does a greater than average density reflect the significance of orchard production.

iii) Population centres.

Although census figures suggest population is widely distributed in a large number of small centres, it is extremely difficult and in some cases almost impossible to define true centres of population, due to the typically dispersed settlement pattern. It is perhaps better to think in terms of rural communities, for place names in practice refer rather to a farming district, often with some geographical unity, such as an enclosed headwater valley, for example, the Crabtree or Mountain River Valleys, or a coastal bay ringed by steep, wooded hills, for instance Cairns Bay, Surges Bay, Flights Bay, Petchy's Bay, etc. This is especially true of the many small communities with populations of 50 to 250, the most frequent size of an orchard community. (Fig.24). Even where a nucleated centre is discernible, the majority of the inhabitants live outside the true settlement centre. It is common to find a 'nucleated' settlement consisting of a mere half-dozen buildings and those made up entirely of the main service units, such as post office, general store, church, petrol pumps, etc.

Only the small number of major settlements of over 500 population show any real degree of nucleation. But even in these centres much of the population counted as within the centre, is in fact dispersed throughout the surrounding district. For example, Geeveston with a total population of 1,301² but with less than half the total - 504, living within

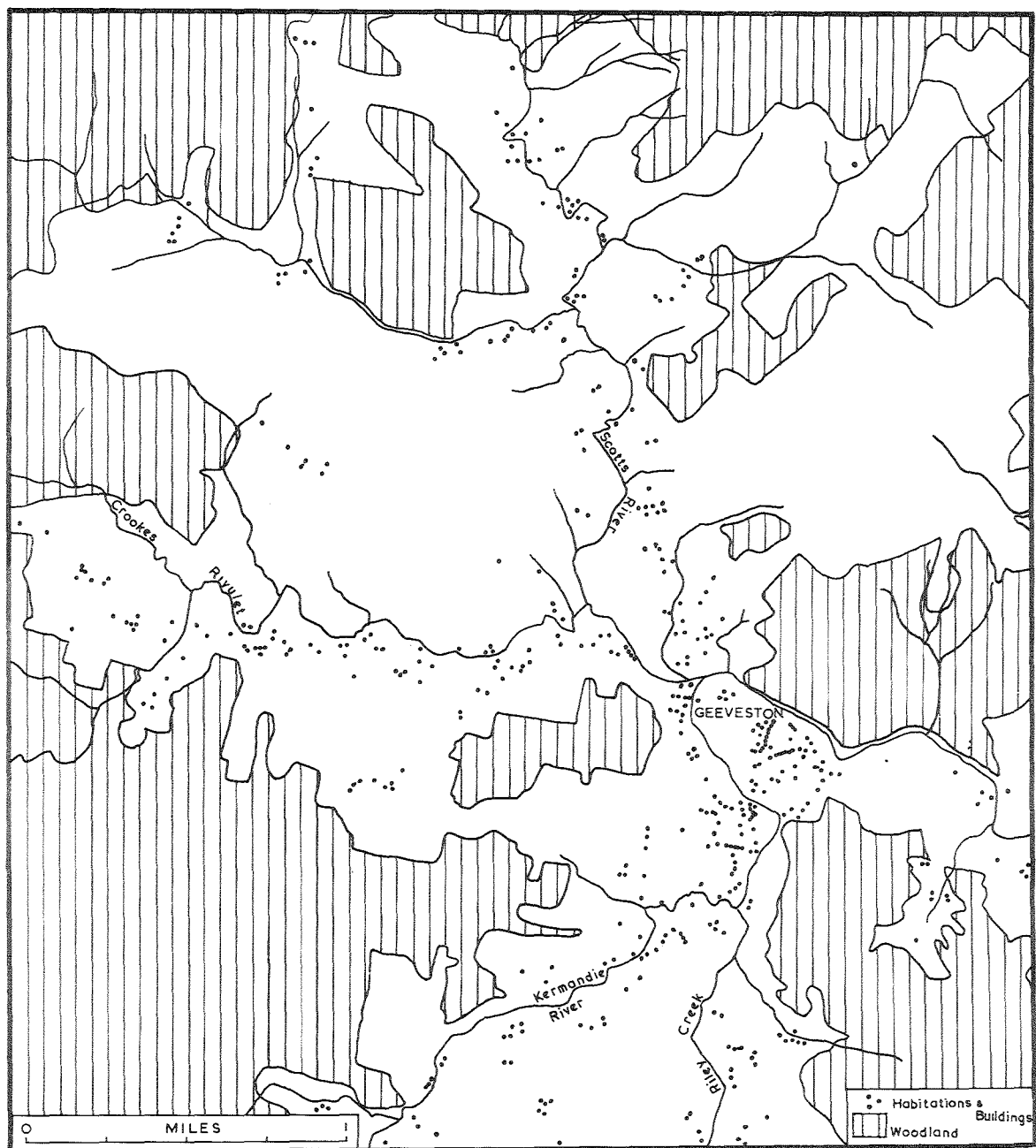


Fig. 26. Settlement Pattern - Geeveston, Huon Valley.

the urban area. The remaining 795 live in farmsteads and dwellings scattered along a number of minor valleys which radiate out from the settlement centre. (Fig. 26). Within even the obvious urban centres such as Huonville and Cygnet, there is a semi-rural character to the settlement with an open linear pattern and many of the buildings farmsteads with their orchard holdings extending up the neighbouring slopes.

iv) Population trends.

The majority of the orcharding communities achieved their maximum population in the 1920's or 1930's at the time when the orcharding industry reached its greatest development. Since 1923 the total acreage under tree fruits has declined, at first only slightly, but since 1946 at an increasing rate. This has been accompanied by a corresponding decline in population of many of the smaller communities, particularly those which depend heavily on orcharding for a livelihood. In some instances, however, an increase in population in the rural service centre has masked the loss. An instance of this is Cygnet (Fig.27) where the outlying areas have experienced population losses of up to 30%, but the population of the township and its immediate surroundings have increased by 10%. The greatest decreases in population have been in those localities that have the most intensive fruit production and therefore the heaviest dependence on orcharding, for example, the lower D'Entrecasteaux Channel, the middle and lower Huon Valley and the Tasman Peninsula - parts of which have experienced decreases varying from 5% - 30% between 1933 and 1954. (Fig.27). However, within these localities the decline has not been a uniform one but has been greatest in the more isolated hill communities on the poorer marginal land. This trend appears likely to continue and there are some indications that it may accelerate as orchardists change over to less intensive types

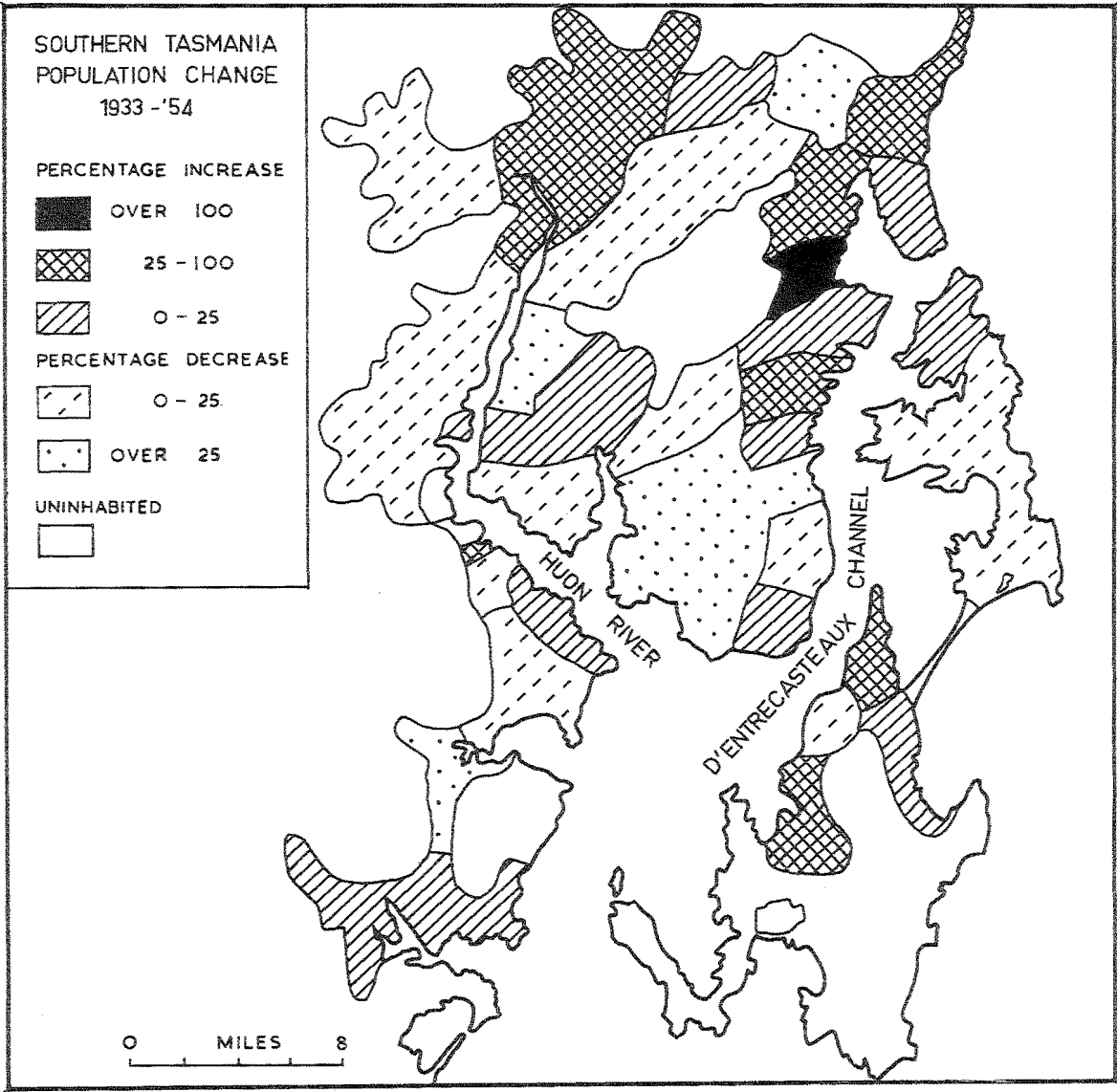


Fig. 27.

of land use such as dairying, fat lamb and beef production. In addition there has been some amalgamation of orchard holdings.

A number of other factors are contributing to this decline of rural population. The increasing mechanisation of orchard operations has led to a decline in the demand for labour. The rising standard of living with the corresponding decrease in the size of families and in the south, the significant decline in the importance of the subsidiary industry are further factors. For example, berry fruit farming and the timber industry - case making is now moving from the forested hills behind the fruit growing areas inland to the upper reaches of the river valleys, where stands of virgin forest remain to be exploited.

Where migration has taken place it has been a selective one of the younger age groups and usually the more talented, who have drifted away to the larger urban centres, Hobart and Launceston, or even to the mainland. This type of migration seems inevitable, at least in the south, due to the lack of opportunities. Little suitable land remains to be developed, sub-division of holdings would be economically impossible and all the year round secondary industry is lacking³. In instances where whole families have migrated it has been predominantly of farm or orchard labourers, rather than farm proprietors.

The northern fruit growing districts along the Tamar are in a much stronger position than their southern counterparts to check this type of population drift. Not only is the regional economy more diversified and becoming increasingly so, but considerable amounts of fair to good land remain to be cleared and developed. Orchardng has contracted to the most

3 The fruit processing factories only operate for some 4 - 5 months of the year.

suitable sites and the most efficient farm units, while other branches of the farm economy are expanding and there is land available for the next generation to develop.

In a number of localities within the fruit growing districts population increase is taking place, though in almost every instance it is non-rural in character. Only in those centres which offer alternative employment has rural population increased, as in the fishing - fruit growing centres of Kettering, Woodbridge and Margate on the D'Entrecasteaux Channel, around North-West Bay (Snug and Electrona) due to the Australian Carbide Works and at Huonville where a number of small secondary industries have been established.

By far the greatest increases of population have taken place where there has been an influx of suburban or dormitory population as is the case where the fruit growing regions adjoin the major urban centres. Hobart now includes the northern portion of the D'Entrecasteaux Channel as a dormitory area, while Launceston's suburbs are expanding rapidly along both banks of the Tamar.

The water frontage sites on the West Tamar have in recent years become popular residential areas for retired Launceston folk with a smattering of Anglo Indians. For instance Gravelly Beach, which in 1921 had a population of only 39 had grown to 395 in 1954, increasing by over 200% between 1933 and 1954. West Tamar orchard properties have been sub-divided into building blocks with part of the orchard retained as a garden.

A more widespread feature of the changing population pattern has been the large scale building of temporary weekend dwellings on coastal and river side sites. This influx of temporary population at weekends and in holiday periods is mainly due to the enormous development of private motoring since the war. Many orchard communities on the East and West Tamar, D'Entrecasteaux Channel and the lower Huon Valley have

been profoundly effected by this type of development. Whole new settlements of temporary dwellings have grown up, in some cases leading to a marked improvement of the existing rural services such as, better roads, electrification, telephone services, shops, etc.

Apart from the external influences on the population pattern, dramatic changes in rural population densities are unlikely to occur. Few of the present influx of European immigrants are settling in the orcharding⁴ areas and as long as the fruit growing industry remains static or declines further, the present population trends appear likely to continue.

v) Cultural zones in the southern orcharding regions.

Within the southern orcharding regions it is possible to distinguish a zonal variation in the distribution of population expressed in terms of population density and socio-economic conditions. Three distinct cultural landscapes occur within the space of a few miles, between the water frontage and main valleys and the headwaters of the coastal streams.

On the lower coastal slopes and in the main valleys settlement is dense. The homesteads of white painted weather board or red brick with red tin roofs are neat and well cared for. Around each are clustered the farm buildings and apple packing shed. The well maintained orchards set out in orderly rows and in regular compact blocks extend up the lower valley slopes. On the steeper upper slopes the orchards give way to grazing land, often newly cleared. An occasional small grouping of habitations at a road junction marks the centre of a village or hamlet, while metalled or good standard gravel roads link the farms and settlements. This is a zone of relatively prosperous orchard communities who are meeting the challenge of lower returns from fruit with increased efficiency

4 There is a Dutch orchardist at Huonville and an Italian at Spreyton, but these are isolated exceptions.

and by expansion and diversification of land use.

Higher up the small tributary valleys and steeper upper slopes of the main valleys, settlement gradually thins out. Farmsteads are smaller, entirely of weather board and invariably shabby and in need of maintenance. Orchard blocks are small and often show signs of neglect. Roads deteriorate from good gravel to poor, rutted surfaces. This is a zone of transition from economic to marginal agriculture.

At the valley ends orchards and settlement cease and rough tracks climb the steep slopes through dense regrowth forest, levelling out occasionally on benches of gently sloping terrain which have been cleared and planted with small blocks of orchard and berry fruits. At a height of 1,000 feet to 1,200 feet⁵ a plateau area is reached. The land here has been partially cleared for small plots of berry fruits, very rarely for orchards and the balance is used for rough grazing. Population is both sparse and scattered with no real nucleations. Housing is of a very low standard, often only a two roomed shack or cabin of unpainted, grey weathered timber and a shingle roof. These isolated hill communities have been found to be inbred and with a low standard of intelligence.⁶ The land is of poor quality, the standard of ability low and the margin above subsistence small. This is a marginal zone in every sense and there are obvious signs of retreat; in the charred stumps and logs around the deserted and decaying saw mills, evidence of the exhausted timber resources, the neglected and overgrown berry fruit patches, the empty decaying dwellings and everywhere the encroachment of the regenerating natural vegetation, blackberries and bracken engulf the grazing land. Isolation, lack of amenities, the migration of the more able

5 The Upper Coastal Surface, Davies, J.L., op. cit.

6 Scott, P., 'An Isonoetic Map of Tasmania', Geographical Review, Vol. XLVII, No. 3, 1957, especially pp. 314 - 315.



Photo. 16. A dense rural settlement pattern of small, compact orchard holdings. Geeveston, Huon Valley.

and the constant struggle to make a living on marginal land as prices decline yearly, has proved too great a burden.

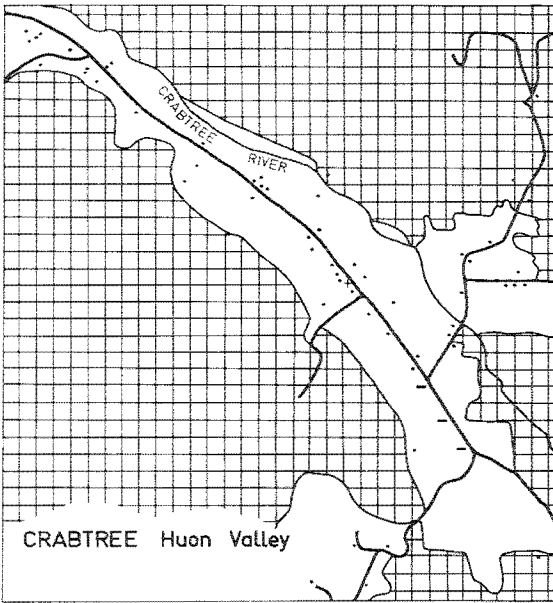
2. The Settlement Pattern.

i) Rural settlement.

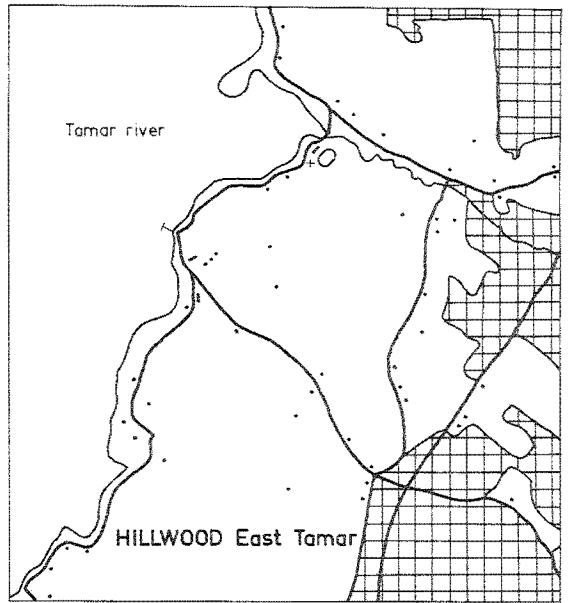
The pattern of rural settlement is a uniform one in most essential aspects throughout the orcharding regions, being closely related to the form of land use, but modified locally by physical conditions. The traditional British practice of planting orchard blocks around the homestead was adopted at the time of pioneer settlement and has persisted ever since. The overall pattern is therefore a dispersed one of isolated farm units spaced at close intervals along a road thus producing a linear alignment of settlement. Typically settlement follows the valley floor with each farmstead on, or set back a short distance from the road and surrounded by its orchard blocks. (Photo. 16).

In the Huon Valley there is a close correlation of lines of settlement with the coast or river frontage and with the stream network. (Fig. 24). Settlement is aligned along the valley floor or on the lower gentler slopes where the deepest and most fertile soils are to be found, but avoiding the river flats or the immediate river flood plain. Orchard plantings extend on either side of the farmstead, down towards the meadow land on the river flats and up the steepening valley sides to the steep, forested upper slopes and heights. In a number of instances aspect appears to influence settlement sites. The north facing valley sides are densely settled and cultivated, whilst the south facing slope remains forested or only partially cleared, for example, the Crabtree Valley. (Fig. 28).

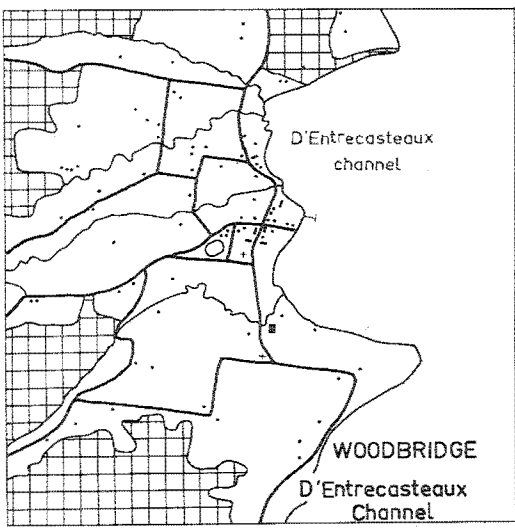
From the lower coastal slopes and basins the typical linear pattern of settlement extends inland, following the bands of workable soils. First along the valleys of the main



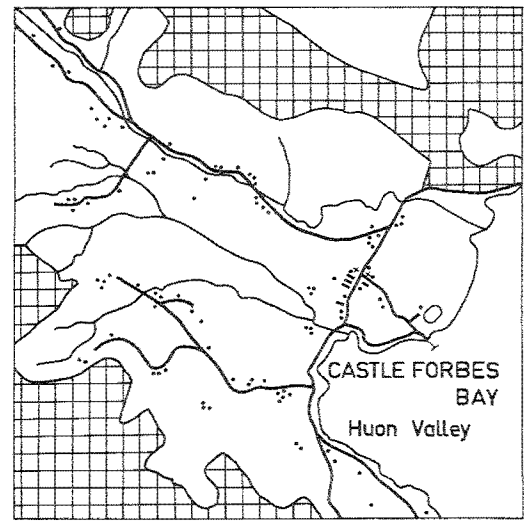
Dispersed linear form.



Dispersed and farmless.



Dispersed but with a nucleated centre



Dispersed linear pattern, with a small functional centre.

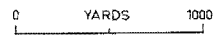
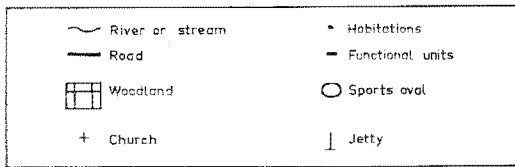


Fig. 28. Rural Settlement Forms.

streams and as these branch, along the tributary valleys, finally following the short narrow valleys formed by the numerous branchings of the finger tip tributaries. Ultimately settlement peters out at the narrowing, blind end of the head water streams where soils and slope become impossible. (Fig.26). In a few instances orchard settlement has taken place on the higher levels. For example, at Braeside in the mid-Huon Valley, a settlement has developed on wide, gently sloping bench or platform at from 500 - 600 feet, but even without the restriction of enclosing valley walls the settlement pattern is still a dispersed linear one.

The northern orchard settlement pattern is a similar one of scattered isolated farm units but with a less marked linear alignment. Physical controls are less exacting and there is only the general control of the patchy nature of good soils exercised through land use.

The lack of nucleation in the fruit growing centres has already been stressed and can now be seen to be the result of the typical dispersed linear form of the settlement pattern. Individual settlements are therefore often formless and completely lacking a central grouping. Even the basic service units of post office, general store and church may be scattered about the settlement district. (Fig.28 Crabtree). Where a definite centre does occur, it is at the most a loose cluster of the main rural service units, (Fig. 28 Castle Forbes Bay), and situated at a valley mouth or junction. Large settlements are few and the overall pattern is one of a dense network of individual farms and habitations scattered throughout the whole of the settled district. (Photo. 16).

ii) Urban settlement.

The most prominent distinction between rural and urban settlement in the orcharding areas is the evidence of true agglomeration to be found in the urban centres - though the term is a relative one.

Urban settlement sites have been influenced by the same basic factors as for rural settlement. Mostly they have grown up from the waterfront settlements established by the pioneer settlers in the mid nineteenth century. The initial choice of site depended on the whim of the pioneer settler whose selection was of course influenced by such factors as, good soils, a water supply and a dry site. But it is the water frontage site which is the basic common factor in the sites of all the major settlements. (Fig. 24).

Until the early 1920's water transport was the dominant form of communication in the Huon Valley, the D'Entrecasteaux Channel, the lower Derwent Valley, the Tasman Peninsula and East Coast and in the north along the Tamar. Each water-side settlement with its wharves and jetties was the focal point for communications in its immediate hinterland. (Fig. 24). Short stretches of roads and tramways extended back along the valleys into the coastal hills. Along these routeways fruit for export was hauled by cart or waggon to the shipping points. At the collecting places with the largest hinterlands developed the first townships.

It is significant that all but one⁷ of the major settlements in the Huon Valley are situated at the lower end of a drainage basin, for instance, Dover, Geeveston, Cygnet and Huonville. Behind each lies a considerable extent of cultivable valley land and each is the obvious focal point for the communications and settlement aligned along the drainage network. (Fig. 24).

In the nineteenth century the term urban was scarcely

7 The exception is Franklin which nevertheless has a waterfrontage site but owes its foundation primarily to the interest shown by Lady Jane Franklin in encouraging settlement in the Huon Valley.

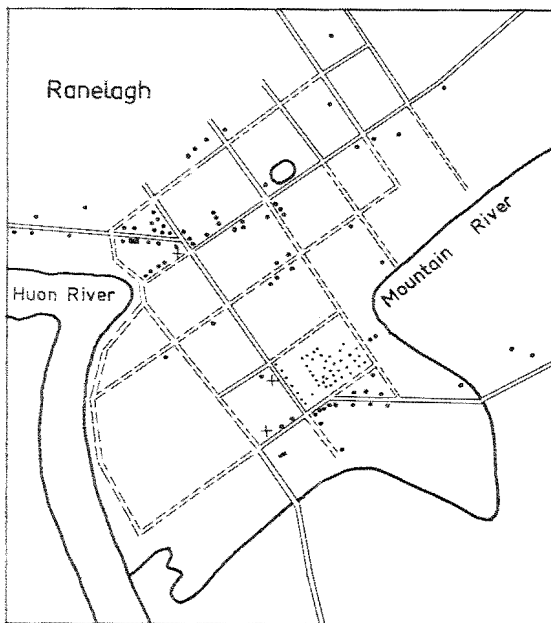
warranted since the early settlements were at the most a scattered collection of wooden buildings with a total population of a mere 100 or so persons. Their claim to urban status lay rather in their functions as collecting, distributing and shipping centres and in the urban services provided, such as church, school, general store, hotel and post office.

By the time road transport was developing in the early 1920's the present settlement pattern was already firmly established, many settlements had reached their peak population and the orcharding industry had achieved its maximum acreage and was even declining slightly. Consequently, modifications of the settlement pattern by road transport have been slight. The only major exception is at Huonville which is growing rapidly due to its importance as a route centre, (Fig. 29) the lowest bridging point on the Huon and the establishment of a number of secondary industries.⁸

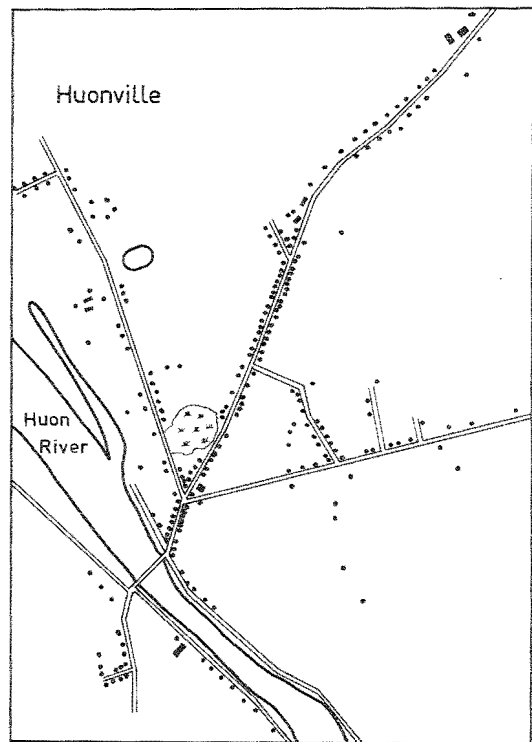
Urban settlement forms.

Linear. Urban settlement has in almost every case developed on an unplanned, open, linear form. Buildings have spread haphazardly, ribboning along the line of a major route-way, or as at Franklin, along the water frontage. (Fig. 29). Even at the core, buildings more often than not are detached and set back from the road with many vacant lots remaining. Franklin is an excellent example of this type of town form, extending one building deep along a single road for over a mile with orchards and gardens lying immediately behind the main street. (Fig. 29). A more recent trend has been to build out from the single main street along the minor roads so producing a radical form as in the case at Huonville. (Fig. 29).

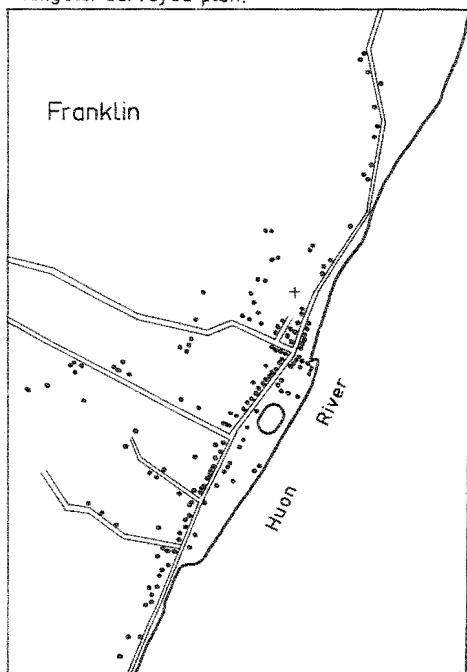
⁸ The proposal to construct a wood pulp industry in the Geeveston area is likely to affect population and settlement in the lower Huon Valley.



A rectangular surveyed plan.



An unplanned, open, linear pattern.



Open linear form, water front site.

- Made roads.
- Track or proposed roads.
- ☁ Marsh.
- + Church.
- ::: Temporary dwellings, -fruit pickers.
- Sports oval.
- Habitations.

0 YARDS 1000

Fig. 29. Urban Settlement Forms.

Rectangular form. A small number of settlements have developed on planned grid-iron form, though only one, Ranelagh has achieved urban status. In the 1840's at the time of commencement of settlement in the south, a considerable number of township sites were chosen arbitrarily by government surveyors. Blocks of land from 500 - 2,000 acres in size were selected and a grid-iron pattern of streets was laid out and named. Owing to poor choice of sites only rarely were blocks of land taken up for building and most remain to this day as forest or agricultural land.

At Ranelagh (formerly Victoria) considerable settlement has taken place for the site is an excellent one overlooking the Huon River at the confluence with its tributary the Mountain River. But the surveyed road pattern has not been fully utilised due in part to the settlement stagnating after the building of the Huon bridge in 1876 some 2 miles downstream and the subsequent growth of a rival settlement - Huonville - along the road leading to the bridging point. The original town centre at Ranelagh was projected for the eastern side overlooking the Mountain River and where land for the church and school was reserved. The present centre, however, lies on the opposite side of the site, the furthest point away from the now more important Huonville, (Fig.29). The church and a number of stone farms and cottages built in the early colonial style, mark the projected centre and provide evidence of the settlement being an older one than Huonville. The lines of the undeveloped sections of the surveyed street system can still be easily traced by a number of narrow, elongated paddocks.

The building materials and style of architecture in the small urban centres is predominantly the typical Australian single story wooden bungalow with a galvanised iron roof. The small core of service units usually contains a number of double storied buildings of brick or concrete blocks - the

town hall, banks, hotel, school, etc., though still with the ubiquitous metal roof. A few nineteenth century stone or brick buildings constructed by convict labour remain to mark the original town centre.

Huonville.

Huonville is now the largest and most important centre in the fruit growing regions of the south. Yet it is something of an enigma for its site is a poor one, occupying land which is marshy and regularly inundated on the flood plain of the Huon River. (Fig. 29). The town owes its origin entirely to the building of the first Huon bridge at this point in 1876. A small settlement grew up on the road leading to the bridge and by 1891 had a population of 145. Growth was rapid, in 1901 the population had reached 261, in 1911 - 413, in 1921 - 580, and in 1947 - 884. In spite of its poor site, Huonville possesses many advantages of situation lying as it does on a right-angled bend of the Huon River. It is the lowest bridging point, the centre and focal point of a prosperous orcharding and pastoral region in the upper reaches of the Huon and Mountain Rivers and there is ample land available for expansion. The development of road transport has considerably enhanced the town's importance and it has become the major collecting, distributing and processing centre in the Huon Valley, eclipsing Franklin, the historic administrative and service centre of the Huon. And yet, but for the chance siting of a bridge at this point, it is doubtful if a major settlement would have been established, for the adjacent Ranelagh has similar advantages of situation and an infinitely superior site.

Urban functions.

In the early period of settlement of the southern fruit growing regions the urban centres were concerned only with the simple primary functions of; a collecting and ship-

ping centre for local produce - fruit and potatoes, a distribution centre - stores, mail and papers, a small service centre - church, primary school, hotel and as a minor industrial centre - sawmilling, flour milling, jam and preserve making. For example in 1858, Franklin had a church, primary school, 3 hotels, 9 shops and stores, a brewery, a flour mill, several sawmills and a wharf.⁹ In the Huon Valley only two other settlements had any real claims to urban status, Lovett (now Cygnet) and Victoria (now Ranelagh) each with a population of about 100 persons.

With the advent of commercial orcharding late in the nineteenth century and the subsequent increase of population, urban centres in the south grew in both numbers and size. Today not only are there 4 minor towns with populations of over 1,000, plus a further 4 villages which possess a number of urban functions, but in addition the functions performed by these centres have expanded to cover a considerable range of interests along with a highly efficient series of social services. It is remarkable compared with European centres of similar status how so small a population can support such a large range of services. Equally striking is the degree of uniformity of services provided by the 4 minor towns.

In Tasmania as a whole the orcharding districts stand out as areas particularly well served by a dense network of small urban centres (minor towns and villages) and numerous local centres (hamlets) while the area with the greatest orchard density, the mid Huon Valley with 4 minor towns all within a radius of 6 miles of each other is unique.

The basic services provided by the minor towns can be classified as follows:-

9 Tasmanian Government Gazette, Hobart, 1858.

Retail - service stations, general stores, butcher, baker, draper, hardware and cafe.

Social - church, school (primary and secondary), hotel.

Entertainment and Recreational - sports oval, hall (films and dances), Returned Servicemens' League, bookmakers club.

Financial and Commercial - banks, offices of fruit shipping agents.

Professional - doctor.

Public Utilities - post office, telephone exchange, health centre, fire station.

Markets - livestock.

Administrative - municipal council, police station.

Industrial - chiefly byproduct and allied industries of the fruit growing industry such as apple drying and canning, case making, cool stores and packing sheds.

Of the southern towns Huonville shows signs of becoming the regional capital.¹⁰ It has the largest population an excellent situation (as distinct from site) and has already acquired a number of additional services - a high school, a dentist, super markets, a branch office of the Department of Agriculture and in addition it is planned to build a regional hospital. There is some rivalry from Cygnet which stages the annual Huon Apple Festival but this centre is handicapped by its peripheral position in relation to the valley as a whole.

The town of Franklin is something of an anomaly. Owing to its origins as the primary settlement in the Huon Valley, it was in the nineteenth century the undisputed 'capital' of the Huon. Now, however, it has even lost its

10 There is a considerable degree of 'regional consciousness' in the Huon Valley, based not only on geographical unity but also on a unity of farming type and a way of life.

status as administrative centre of the Huon municipality, a position held by Huonville. The reason appears to lie in the growth of rival centres. Franklin, with no immediate hinterland of its own and once relying on the whole valley as its hinterland, has stagnated. But the town still retains many of its urban services, for instance a bank. It is noteworthy that the only local newspaper is still printed here - a monthly fruit growers' magazine.

In the fruit growing districts along the Tamar and Mersey, orcharding is not sufficiently extensive to create even small urban centres which cater primarily for the needs of an orcharding community. On the West Tamar the small centres of Beaconsfield, Beauty Point and Exeter do, however, have a considerable emphasis on orcharding. The East Tamar orchardists look to an entirely external centre, Launceston, as do the Spreyton orchardists with respect to Devonport. But within these centres are to be found services peculiar to the orchardists' needs - central packing sheds, cool stores, the office and depots of the fruit shipping agents, suppliers of orcharding equipment, processing factories and case making.

The urban fields of the Huon towns are to a great extent based on physical accessibility, due to the valley being broken up by blocks of forested upland into a number of relatively isolated orcharding districts. The size of the centre appears to be predetermined by the stage of development and fertility of the surrounding agricultural hinterland. Significantly Huonville with the largest and richest hinterland has become the largest and fastest growing urban centre. In contrast the D'Entrecasteaux Channel which has no major areas of cultivation but only small pockets at the valley mouths, lacks any major centres.

Of the numerous local centres (villages and hamlets) which are widely scattered throughout the fruit growing regions,

all have the same basic function of being the centre and focal point of a distinct agricultural unit, whether it be a valley, as is usually the case in the south, or a patch of better land as in the north. The village centres have much simplified urban functions, for example:-

Retail - general store, butcher and service station.

Social - church, primary school, hotel.

Recreational - hall, sports oval.

Public Utilities - post office, telephone exchange.

Administrative.- police station.

Industrial - fruit processing and case making.

The smallest centre, the hamlet provides only the everyday basic needs of the immediate locality - post office and telephone exchange, general store, petrol pumps (often one unit provides all three services) and a church (though services are usually monthly). One notable feature of the Huon Valley is the large number of churches embracing a wide range of denominations, a reminder of the isolation in the nineteenth century and the desire of the early settlers to worship in their own way regardless of how few their numbers. For example Cradoc in Cygnet municipality has a population of less than 200 persons but possesses 3 churches.

It is an undisputed fact, however, that despite a well developed settlement hierarchy, the southern orcharding regions lie within the urban sphere of Hobart rather than that of any local centre. Both as the controlling centre of the fruit industry (marketing, shipping, orchard supplies, finance, by-product and allied industries) and as an extra-regional centre in other urban fields, Hobart is in a dominant position. In the north, owing to the lack of development of small urban centres there is even greater emphasis on control from the adjacent major urban centres.

CONCLUSION

1. Factors which Prompted the Development of Orchardring.

The impetus for the development of an orcharding industry in Tasmania primarily stems from the growth of overseas market demand, at first in the mainland colonies and later in the United Kingdom and Western Europe. The expansion and subsequent changes in the pattern of trade have brought with them corresponding growth and changes in the orchard economy. In the early and mid nineteenth century Tasmania was the major producer of pome fruits in the Australian colonies supplying the colonial urban markets on the mainland and in New Zealand. This trade was stimulated by the increasing population and by intermittent gold rushes. Neither the producer nor the colonial consumer was greatly discriminating as to the variety or quality of fruit sold. Apples and pears were grown on small, haphazardly planted, neglected and often disease ridden farm orchards or suburban fruit gardens with a result that the fruit was frequently diseased or blemished and presented in the most rough and ready manner. Early in the 1880's improved technology in the shape of fast steam ships and refrigeration saw the beginnings of apple shipments to the United Kingdom, a development favoured by the difference in seasons and the prior existence of trade links and market facilities. But the new market brought with it new demands for high standards of quality and necessitated trading and production on a specialised commercial footing.

From 1890 to 1917 there was rapid expansion of commercial plantings and orchard production but concentrated within a few localities, while at the same time the ubiquitous casual farm orchard gradually disappeared. Almost entirely

the new commercial orchards were orientated to supplying a steadily growing United Kingdom market, although shipments to the mainland also expanded rapidly. In this boom period the total export trade expanded from 150,000 bushels in 1880 to over 2,000,000 bushels in 1914. By the early 1920's the present pattern of production and trade was clearly established, supplying three main markets - the United Kingdom and Western Europe receiving only the highest grade fruit, the mainland the surplus from the overseas markets, and the processing factories and local market the poorer grades.

2. Factors Influencing the Selection of Orchard Location.

At no time in the planting of commercial orchards in Tasmania has the choice of orchard location been made with close regard to physical factors. The pattern of distribution is due rather to the personal whim of individual settlers or developing companies, who though obviously influenced in some degree by apparently favourable conditions, thought more in terms of potential profits than inches of rainfall or mean temperatures. There remain many areas in Tasmania where climate and site are well suited to orcharding, better suited indeed than in some of the established orchard regions, while even within the orchard regions there are few places where orchards are continuous.

From the early days of settlement the Tasmanian environment was generally recognised as being well suited to the deciduous fruits, especially in comparison with the mainland colonies, and the island achieved a name for the excellence of its pome fruits. Prior to commercial development, orchards were widely planted in all the areas where agriculture was possible and since orchards were invariably planted adjacent to the homestead, choice of location rested

solely on the selection of the farmsite. In any case regular yields and high quality were neither achieved nor expected and crop fluctuations due to adverse conditions or pests were considered inevitable. When commercial plantings began after 1870 this mood still persisted and low costs of production effectively masked variation in production and quality. Perhaps more regard was paid to site factors, a deep, well drained soil with a water retaining subsoil was considered desirable but soil fertility was of little significance. In the south there was evidently some preference for a sunnier northerly or easterly aspect in the narrow enclosed valleys. Slope placed some limitations on choice, for though a gentle slope aided drainage, too steep a gradient handicapped cultivation. But climatic factors were undoubtedly of incidental rather than compelling importance and it is perhaps surprising that despite haphazard selection the majority of locations have proved to be favourable. However, with such cursory regard for climate and site conditions it was inevitable that many unwise plantings took place. In the mid and lower Derwent, the Dysart Valley, and at Triabunna it was soon apparent that regular high yields were impossible due to low rainfall. The rapid speculative development in the Tamar Valley where the main criteria of choice of site was the availability of cheap land for sub-division, led to many failures due to poor drainage or exposed sites. Yet even here, but for the initiative of the developing companies, it is unlikely an orchard industry would have been established.

Without any doubt the factor which has most strikingly influenced orchard location is accessibility. Since commercial orchard development was dependent on overseas markets, ease of access to a collecting centre and port was of prime significance. In the Huon Valley, the Derwent,

D'Entrecasteaux Channel, Tasman Peninsula and at Triabunna, water transport by small river craft was cheap, safe and the only means of bulk carriage. The coastal or estuarine site was therefore a near necessity. During the later commercial plantings railway development allowed the extension of plantings to inland locations but the water frontage site and access to river jetties was of prime importance in the latest plantings of all on the Tamar. Somewhat paradoxically both water and rail transport are no longer used for the carriage of export fruit, having been gradually replaced since 1920 by motor transport. Despite its obvious flexibility, road transport has made little impact on orchard location for few plantings have taken place since its introduction. Rather its effects have been negative in that some districts, for instance the East Tamar, Tasman Peninsula and the lower Huon are now relatively further from an export outlet both as to actual distance and in terms of transportation costs.

Since the end of the orchard boom there has inevitably been some adjustment to physical factors. As costs of production have risen and market competition increases there is greater need for regular high yields and standards of quality - thus there has necessarily been contraction to the most favoured regions and the most efficient holdings. In the mid and lower Derwent and lower Midlands low rainfall and a higher incidence of spring frosts have caused a heavy decline in acreage. At Triabunna insufficient rainfall in many years has contributed to a fall to half the original acreage. Losses on the Tamar have been heavy on poor sites, though equally telling were the poor rootstocks planted and the shortage of capital and lack of practical experience of the Anglo-Indian absentee owners. The Tamar Valley is

an extreme case where human factors in the shape of early mismanagement of plantings have been sufficiently strong to offset favourable climatic conditions. The Tamar is so handicapped by this legacy of unwise plantings as to be unable to exploit the slight climatic advantages it possessed over other areas. In all regions there is increasing awareness of losses through climate extremes, for instance hail and drought. Climate has become of prime importance today but it is a realisation which has come too late to influence the choice of orchard location.

3. The Regional Pattern.

The pattern of distribution that has emerged is one of a number of specialised regional concentrations characterised by very intensive utilisation of small areas of land. Only where there is a certain concentration of holdings does orcharding contribute to the character and personality of the region, for within even the most intensively planted belts there is a tendency for orchard land to be in irregular pockets. The Huon Valley undoubtedly has a regional character and consciousness based on orcharding but this is far less evident in other orchard regions.

The present orcharding landscape is largely a product of the late nineteenth and early twentieth centuries for little fresh planting has taken place since 1917. And though it is a landscape which exhibits a conspicuous degree of homogeneity there are nevertheless fundamental though not always obvious differences between the various regions based on the period and type of planting. The contrasts between the northern and southern regions are the most striking and are still strongly evident. The southern holdings with their larger more densely planted trees, small orchard blocks and holdings, the predominance of apple trees, the intensive cultivation and very high yields are the product

of the efforts of pioneer settlers who slowly carved farms out of the dense eucalypt forests and planted small blocks of seedling apple trees on each cleared area. The Tamar and Mersey orchards by contrast have smaller trees widely spaced, larger orchard blocks and holdings, pears are more extensively planted; shelter belts of exotics surround many orchards and there is a greater overall uniformity. These regions represent the culminating point of the period of commercial planting, when in the years immediately prior to 1917, hasty speculative plantings on the Victorian system of orchard farming were undertaken by land companies for absentee owners. The other regions all possess some degree of individuality. The Derwent Valley orchards are instances of commercial orcharding within a mixed farm economy, while Triabunna is unique in representing the speculative development of a large pome fruit plantation by a Hobart canning company.

4. The Dominance of Hobart.

Hobart occupies a position of unique importance in relation to pome fruit growing in Tasmania, for apart from a brief period of rivalry from Launceston in the mid nineteenth century, Hobart has always been the major urban market, export outlet and commercial centre for the industry. Nevertheless this dominance has passed through several phases of development. Early in the nineteenth century Hobart was itself a small producing centre and the export outlet for the fruit grown in the districts around. The commercial development which took place after 1880 saw the city become the commercial, marketing and financial centre and port for a number of rapidly expanding fruit growing regions in the Huon Valley, D'Entrecasteaux Channel, the mid and lower Derwent Valley. Its focal position at the heart of a number of

estuarine and coastal waterways, at a time when water transport was unchallenged, made Hobart's supremacy inevitable. Railway construction in southern Tasmania at the end of the nineteenth century merely served to emphasise and extend the port's hinterland to the upper Derwent, lower Midlands and even to the northern orchard districts around Lilydale and Scottsdale. Increased government guidance and control added yet another function - that of administrative centre. Until the early 1920's Hobart was the only overseas port and was still overwhelmingly dominant in the 1930's, handling up to 85% of the fruit trade.

Today there are signs of decentralisation encouraged by the rapid development of road transport and its greater flexibility. Though 60% of apple and pear shipments still pass through Hobart, more than 1,000,000 bushels of fruit are now shipped from other ports, Beauty Point in the north and Port Huon in the south. No longer is Hobart at the hub of a group of producing regions, for orchards in the mid and lower Derwent and lower Midlands are now of minor importance, while in both the upper Huon Valley and D'Entrecasteaux Channel there has been some loss of orchard land. The centre of gravity of production has moved south to the mid and lower portions of the Huon Valley, leaving Hobart by reason of its past associations still the leading port and commercial centre but in a peripheral position.

5. The Changing Pattern.

Though endowed with a highly favourable environment for pome fruit growing the lack of a local market and the consequent dependence on distant overseas outlets make it inevitable that Tasmania is extremely vulnerable to changing market conditions. The general picture is one of contraction and increased competition within the traditional marketing pattern. The United Kingdom remains the leading

market but an increasingly competitive one and Tasmania is further handicapped by distance and high freight costs, while improvements in cool storage technique have greatly diminished the seasonal advantage. As a pioneer of refrigerated fruit shipments Tasmania still suffers from the legacy of a poor marketing organisation in comparison with her leading rivals, South Africa, New Zealand and Argentina. The interstate market is likewise of decreasing significance and though the demand for fruit for processing has increased it does fluctuate widely. Small increases in shipments to the Asian markets and in sales locally do little to offset market pressure elsewhere. In the long run the northern orchards are perhaps better placed to withstand future contraction. The local market is relatively more important to the northern grower, there is greater emphasis on pear production where market prospects are brighter and the north is likely to benefit from improved sea links to the mainland.

It has chiefly been market pressure which has forced rationalisation on the industry and present trends towards more specialisation and standardisation seem likely to continue. The total acreage of apples has declined by over 10,300 acres or 38% from the peak of 26,760 acres in 1922 and that of pears by 1,476 acres or 45% since the peak year of 1941. Orchards are becoming increasingly concentrated in those areas most suited physically to commercial fruit growing and which can support the necessary array of secondary facilities - cool stores, processing factories, etc. The orchard holding is also experiencing greater specialisation. Holdings are larger and fewer in number - though the average orchard is still small and owner operated. Methods of production are being intensified by introducing mechanisation - bulk handling equipment, power sprays -

by installing irrigation facilities, concentration on fewer varieties and above all by more efficient management. The results are to be seen in improved standards of colour and shape of fruit, more regular cropping and the increased yields which have more than offset declining acreages. Standardisation of tree size, the size of orchard blocks and tree spacing is doing much to remove the more obvious signs of regional variety. Somewhat 'out of line' with the intensification of orcharding has been the attempt by many growers to introduce some form of diversification to their farming enterprise and small scale grazing of livestock is now commonly an adjunct to fruitgrowing.

The Tasmanian pome fruit industry appears to have reached the penultimate stage of its sequence of development having passed from the initial widespread distribution of farm and kitchen garden orchards, to localised commercial plantings, which have in turn contracted to a small number of intensive and highly specialised orchard regions. The ultimate stage of abandonment may well be in sight. The future, like the past, will be found to hinge on the changing pattern of markets.

A P P E N D I X

Appendix A: The Pome Fruits - Numbers of Orchardists, Trees and Production (by municipalities and orchard regions)

Municipality	Number of Orchardists	1959				Production (bushels)	
		Apple Trees		Pear Trees		Apples	Pears
		Bearing	Non-Bearing	Bearing	Non-Bearing		
Latrobe	27	49,198	4,287	2,512	40	101,796	3,977
Devonport	8	54,851	6,861	2,448	12	147,304	6,378
Kentish	2	2,436	100	—	—	3,103	—
MERSEY	37	106,485	11,248	4,960	52	252,203	10,355
Beaconsfield	143	215,630	22,091	46,035	890	480,375	117,968
George Town	20	40,329	2,493	7,622	341	83,653	19,109
Lilydale	31	46,266	3,276	5,814	91	95,234	12,360
Scottsdale	3	3,847	24	300	—	6,562	283
TAMAR	197	306,072	27,884	59,771	1,322	665,824	149,720
New Norfolk	54	30,640	1,204	5,800	966	71,132	16,617
Glenorchy	49	11,715	317	1,224	49	12,560	1,753
Clarence	29	9,175	180	21,926	1,536	9,100	25,013
Green Ponds	5	1,293	—	288	—	1,019	346
DERWENT	137	52,823	1,701	29,238	2,551	93,811	43,729
Sorell	27	24,827	41	12,928	1,762	4,295	768
Spring Bay	1	—	—	—	—	23,189	21,761
Tasman	39	84,858	4,000	34,938	3,362	180,537	70,758
SOUTH-EAST	67	109,685	4,041	47,866	5,114	208,021	93,287
Kingborough	171	255,394	29,723	18,808	3,109	468,735	27,817
Bruny	14	22,014	1,670	1,623	381	41,090	4,858
CHANNEL	185	277,408	31,393	20,431	3,490	509,825	32,675
Huon	331	664,920	64,269	26,011	3,031	1,537,054	56,185
Cygnat	285	442,878	43,139	15,858	1,094	875,353	28,730
Esperance	218	393,237	47,129	6,900	608	838,842	18,605
HUON	834	1,501,035	154,537	48,769	4,733	3,251,249	103,520
TOTAL	1,561	2,352,626	231,106	211,330	17,418	4,983,000	433,000

Apples and Pears - Production, Acreage and Average Yields, 1860-1959.

Year	<u>APPLES</u>			<u>PEARS</u>		
	Acreage	Production	Yield Per Acre	Acreage	Production	Yield Per Acre
1860		89,327			32,258	
1861		108,810			22,049	
1862		106,544			29,195	
1863		131,254			26,575	
1864		168,114			25,800	
1865		128,784			13,846	
1866		160,990			13,828	
1867		128,359			15,431	
1868		122,939			10,800	
1869		169,478			25,670	
1870		132,200			23,070	
1871		147,617			27,553	
1872		142,756			20,801	
1873		143,486			25,097	
1874		174,551			15,042	
1875		150,978			31,020	
1876		136,682			16,310	
1877		153,842			23,148	
1878		138,215			16,583	
1879		137,215			18,684	
1880		140,272			19,340	
1881		155,237			22,271	
1882		142,217			22,271	
1883		236,805			24,864	
1884		207,999			30,310	
1885		279,637			21,772	
1886		290,000			24,013	
1887		315,128			22,434	
1888		289,904			18,125	
1889		367,426			21,872	
1890		803,013			29,828	
1891		368,986			23,204	
1892		604,255			65,075	
1893		391,912			27,543	
1894		661,350			37,312	
1895		677,675			29,183	
1896		510,387			31,510	
1897		-			-	
1898		407,750			25,774	
1899		363,915			33,738	
1900		643,209			34,629	
1901		551,251			59,480	
1902		843,348			50,212	
1903		684,945			49,801	
1904		977,362			76,631	
1905		1,071,015			74,882	
1906		669,002			42,999	
1907		947,029			96,157	
1908		1,007,800			37,322	
1909		1,070,546			71,336	
1910		1,480,107			94,865	
1911		1,347,952			115,954	
1912		1,505,944			100,527	
1913		1,331,324			94,202	
1914	16,952	1,925,867	113	913	150,447	164

<u>APPLES</u>				<u>PEARS</u>		
Year	Acreage	Production	Yield Per Acre	Acreage	Production	Yield Per Acre
1915	17,702	1,521,579	85	975	145,882	144
1916	19,076	1,985,767	104	1,114	141,723	127
1917	19,712	1,446,996	73	1,265	196,472	155
1918	20,607	1,489,051	72	1,308	136,409	104
1919	22,245	1,976,000	89	1,284	173,000	135
1920	25,079	2,351,000	94	1,489	176,000	118
1921	25,610	2,359,000	92	1,567	180,000	115
1922	26,760	2,990,000	112	2,000	207,000	104
1923	25,630	3,127,000	122	1,930	204,000	106
1924	25,681	1,889,000	74	1,936	183,000	95
1925	25,658	2,210,000	86	1,920	172,000	90
1926	25,478	4,132,000	164	1,904	219,000	116
1927	25,008	2,900,000	116	1,949	242,000	124
1928	25,296	4,673,000	185	2,006	174,000	87
1929	25,252	2,800,000	99	2,042	187,000	92
1930	23,628	3,960,000	167	1,977	274,000	139
1931	23,901	3,800,000	159	2,075	302,000	150
1932	23,172	5,844,000	252	1,906	279,000	146
1933	23,234	4,410,000	190	1,915	285,000	149
1934	23,316	4,953,000	212	1,936	222,000	115
1935	23,439	3,934,000	168	2,017	280,000	139
1936	22,971	3,980,000	172	2,042	211,001	103
1937	21,609	4,611,000	213	2,063	270,001	131
1938	21,946	4,792,000	218	2,091	214,000	102
1939	21,459	5,724,000	266	2,085	376,000	180
1940	21,870	5,148,000	235	2,192	315,000	144
1941	21,765	5,946,000	273	2,676	529,000	198
1942	22,165	6,356,000	287	2,230	409,000	183
1943	21,965	5,742,000	261	2,210	519,000	235
1944	21,983	8,022,000	365	2,134	590,000	277
1945	21,556	6,569,000	305	2,220	550,000	248
1946	21,503	8,522,011	396	2,225	524,000	236
1947	21,112	4,338,000	200	2,254	527,000	234
1948	20,360	7,894,000	388	2,155	600,000	279
1949	19,338	2,562,000	133	1,799	271,000	151
1950	18,931	4,794,000	253	1,738	268,000	155
1951	18,231	4,848,000	266	1,711	306,000	179
1952	17,975	4,930,000	274	1,683	306,000	152
1953	17,791	3,757,000	211	1,702	323,000	190
1954	17,253	5,304,000	299	1,681	360,000	221
1955	17,025	5,009,000	294	1,592	426,000	258
1956	17,175	5,926,000	345	1,644	537,000	327
1957	16,690	3,401,000	204	1,500	295,000	194
1958	16,812	6,635,000	395	1,333	566,000	408
1959	16,435	4,983,010	303	1,436	433,000	293

= Assessed Crop.

APPENDIX C

TASMANIAN EXPORTS OF APPLES AND PEARS - OVERSEAS AND

INTERSTATE. 1858-1960. (Bushels)

Year	Overseas	Interstate	Totals	Year	Overseas	Interstate	Totals
1858		121,156	121,156	1910	321,746	347,425	669,171
1859		91,487	91,487	1911	957,725	=	957,725
1860	290	106,611	106,901	1912	664,822	=	664,822
1861	200	118,503	118,703	1913	612,523	=	612,523
1862	60	136,655	136,715	1914	951,722	1,096,397	2,048,119
1863		154,971	154,971	1915	493,217	1,245,081	1,738,298
1864	114	166,024	166,138	1916	814,590	942,749	1,757,339
1865	302	156,999	157,301	1917	132,190	627,958	760,148
1866	322	165,570	165,892	1918	=	853,114	853,114
1867	1	158,449	158,450	1919	262,633	1,001,434	1,264,067
1868	250	145,869	146,119	1920	457,833	1,271,697	1,729,530
1869		175,630	175,630	1921	585,563	1,500,000	2,085,563
1870	50	144,572	144,622	1922	1,357,073	1,515,000	2,872,073
1871	380	131,367	131,747	1923	1,530,700	1,506,000	3,036,700
1872		130,147	130,147	1924	1,068,430	580,000	1,648,430
1873	63	125,523	125,586	1925	1,354,621	612,000	1,966,621
1874		179,762	179,762	1926	2,147,352	1,673,000	3,820,352
1875		159,224	159,224	1927	1,106,829	1,365,758	2,472,587
1876	25	135,327	135,352	1928	2,800,110	1,373,047	4,173,157
1877	120	148,901	149,021	1929	934,259	1,279,681	2,213,940
1878		123,783	123,783	1930	2,722,432	1,041,101	3,763,533
1879		144,000	144,000	1931	2,415,472	1,333,841	3,749,313
1880		155,468	155,468	1932	3,491,928	2,221,739	5,713,667
1881	222	173,517	173,739	1933	3,282,514	1,037,815	4,320,329
1882	150	197,227	197,277	1934	3,080,895	1,679,481	4,760,376
1883	100	264,525	264,625	1935	2,612,599	1,134,966	3,747,565
1884	19	221,897	221,916	1936	2,880,014	974,610	3,854,624
1885		303,708	303,708	1937	2,895,180	1,770,814	4,665,994
1886		292,888	292,888	1938	2,866,182	1,816,551	4,682,733
1887		319,229	319,229	1939	3,074,129	1,834,044	4,908,173
1888		309,657	309,657	1940	1,148,337	2,492,954	3,641,291
1889	18,390	368,666	387,056	1941	42,171	1,379,985	1,422,156
1890		543,000	543,000	1942	N.S.	2,281,609	2,281,609
1891	129,391	235,690	365,281	1943	N.S.	1,633,277	1,633,277
1892	191,664	434,336	626,000	1944	N.S.	1,669,906	1,669,906
1893	121,479	244,203	365,682	1945	192,490	1,403,895	1,596,385
1894	114,649	502,978	617,627	1946	1,169,804	1,083,553	2,253,357
1895	151,127	414,033	565,160	1947	258,427	707,202	965,629
1896	142,041	456,433	598,474	1948	2,744,668	670,960	3,415,628
1897	134,816	471,092	605,908	1949	1,061,734	394,333	1,456,067
1898	130,316	339,684	470,100	1950	2,493,268	741,811	3,235,079
1899	149,466	380,675	530,141	1951	2,617,196	726,083	3,343,279
1900	170,099	499,601	669,700	1952	3,195,317	612,113	3,807,430
1901	218,546	450,554	669,100	1953	2,486,707	695,672	3,182,379
1902	369,877	712,323	1,082,200	1954	3,690,963	296,247	3,987,210
1903	298,316	517,384	815,700	1955	3,611,487	630,886	4,242,373
1904	575,419	570,581	1,146,000	1956	3,899,603	701,425	4,601,028
1905	363,426	1,067,419	1,430,845	1957	2,473,771	416,267	2,890,038
1906	262,386	479,685	742,071	1958	4,296,022	536,212	4,832,234
1907	524,316	566,131	1,090,447	1959	3,062,260	=	=
1908	487,967	502,833	990,800	1960	2,554,208	=	=
1909	380,214	448,991	829,205				

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No record available.

APPENDIX D

TASMANIAN EXPORTS OF GREEN FRUIT. 1857-78 by ports (bushels)

HOBART								LAUNCESTON								
Year	N.S.W.	Vic.	Qld.	S.Aust.	N.Z.	Others	Total	Value	N.S.W.	Vic.	Qld.	S.Aust.	N.Z.	Others	Total	Value
1857	832	33,879		40	34		34,711	£22,154								£24,000
1858	238	46,162			30		48,573	£30,530	64	72,519					72,583	£41,640
1859	963	49,253		40	70		50,326	£30,750	6	41,155					41,161	£28,480
1860	7,361	71,180	10	20	40	290	78,901	£39,261	386	27,841					28,000	£13,000
1861	4,572	50,730	480	262	420	200	56,664	£27,980	243	61,740		56			62,039	£18,286
1862	10,245		497		10,389	60	25,778	£29,597	541	59,695	450		250		60,937	£17,792
1863	18,367	50,652	569	85	16,644		86,317	£35,530	190	50,475	165		1,823		58,654	£18,123
1864	23,193	66,152	1,177	100	24,511	114	115,247	£42,080	247	43,903			1,341		44,891	£14,576
1865	28,948	92,453	986	10	14,992	302	137,671	£46,915	70	19,509			33		19,610	£ 6,042
1866	33,274	82,735	1,594	12	13,192	212	131,019	£45,240	241	34,166	346	10		110	34,873	£ 9,024
1867	29,170	85,501	1,311	158	19,131		133,171	£43,690	52	23,313	499		1,414	1	25,279	£ 5,562
1868	33,758	57,688	427	130	8,775	50	100,828	£34,000	182	48,869	484		551	200	45,291	£10,530
1869	40,166	71,244	1,425	40	22,807		133,682	£42,160	303	39,434	159	8	44		39,940	£ 9,061
1870	30,090	66,283	383	100	7,525	50	104,471	£35,535	120	40,071					40,191	£ 9,175
1871	44,727	44,104	753	126	17,266	380	107,356	£29,385	20	24,179	192				24,391	£ 4,130
1872	50,675	42,246	643		18,212		111,776	£33,470	317	17,884	170				18,371	£ 3, 565
1873	39,216	47,186	700		14,537	63	102,001	£31,905	544	22,800	241				23,585	£ 5,124
1874	64,215	56,890	300		30,452		151,857	£42,720	978	26,285	557	85			27,905	£ 6,696
1875	68,316	34,571	785	11	34,930		138,613	£36,649	42	19,831	378		360		20,611	£ 4,388
1876	66,568	24,227	1,356	7	21,651	25	113,834	£41,831	1,996	19,402					21,518	£ 4,589
1877	74,864	25,258	893	30	37,390	120	138,585	£44,001	134	10,174			128		10,436	£ 2,718
1878	67,953	19,363	100		24,401		111,819	£41,013	1,628	10,187	151				11,966	£ 4,465

APPENDIX E

TASMANIAN EXPORTS OF GREEN FRUIT. 1857-1901 (bushels)

Year	New South Wales	Victoria	Queensland	South Australia	New Zealand	United Kingdom	Germany	India & Ceylon	Others	Total	Value
1857											£44,154
1858	302	118,681			30					121,156	£72,170
1859	969	90,408		40	70					91,487	£59,230
1860	7,747	99,021	10	20	40				290	106,901	£52,261
1861	4,815	112,470	480	318	420				200	118,703	£46,266
1862	10,736	112,282	947		10,637				60	136,715	£47,389
1863	18,557	101,127	734	85	18,467					154,971	£53,653
1864	23,440	110,055	1,177	100	25,852				114	166,138	£56,656
1865	29,018	111,962	986	10	15,025				302	157,301	£52,957
1866	33,515	116,901	1,940	22	13,192				322	165,892	£54,264
1867	29,222	108,814	1,710	158	20,545				1	158,450	£49,252
1868	33,945	106,557	911	130	9,326				250	146,119	£44,530
1869	40,469	110,678	1,584	48	22,851					175,630	£51,221
1870	30,210	106,354	383	100	7,525	50				144,622	£44,710
1871	44,747	68,283	945	126	17,266				380	131,747	£33,519
1872	50,992	60,130	813		18,212					130,147	£37,035
1873	39,760	69,986	941		14,537				63	125,586	£37,029
1874	65,193	83,175	857	85	30,452					179,762	£49,416
1875	68,358	34,402	1,163	11	35,280					159,224	£41,037
1876	68,564	43,629	1,356	7	21,651				25	135,352	£46,420

TASMANIAN EXPORTS OF GREEN FRUIT. 1857-1901 (bushels) (continued)

Year	New South Wales	Victoria	Queensland	South Australia	New Zealand	United Kingdom	Germany	India & Ceylon	Others	Total	Value
1877	74,998	35,432	893	30	37,518				120	149,021	£ 46,719
1878	69,561	29,550	251		24,401					123,783	£ 45,478
1879	64,304	92,282	160		45,506					144,000	£ 51,512
1880	73,600	30,500	82	184	50,000					155,468	£ 49,356
1881	84,960	27,607	926	224	59,796	82			140	173,739	£ 55,343
1882	114,535	57,397	380	271	24,000	150				197,277	£ 70,526
1883	156,457	41,181	232	1,793	64,889				100	264,652	£ 80,156
1884	163,391	22,941	845	124	34,596	19				221,916	£ 85,016
1885	204,439	39,906	3,297	307	55,639				120	303,708	£ 95,126
1886	212,216	36,031	158		44,483					292,888	£100,758
1887	181,166	77,186	5,125	80	55,672					319,229	£ 91,767
1888	122,877	85,113	4,599	40	47,028					309,657	£ 83,982
1889	253,021	84,407	3,541		27,697	18,390				387,056	£110,183
1890	364,922	149,877	1,559	1,103	25,704					543,000	£120,000
1891	179,192	34,459	765	3	16,373	129,391				365,281	£112,600
1892	345,314	51,190	6,167	590	36,000	186,415		145	5,104	626,000	£136,712
1893	195,523	19,240	88	151	29,201	121,479				365,682	£111,334
1894	411,680	38,684	7,119		45,495	114,649				617,627	£184,668
1895	347,235	21,894	4,683		40,221	151,127				565,160	£130,313

TASMANIAN EXPORTS OF GREEN FRUIT. 1857-1901 (bushels) (continued)

Year	New South Wales	Victoria	Queensland	South Australia	West Australia	New Zealand	United Kingdom	Germany	India & Ceylon	Others	Total	Value
1896	408,135	24,050 $\frac{1}{2}$	3,003		97	21,148	142,041				598,474	£130,222
1897	412,000 $\frac{1}{2}$	23,596 $\frac{1}{2}$	4,873			28,901	134,816		70	1,151	506,908	£148,954
1898	302,024	16,300	5,479		30	15,772	130,316		150		470,100	£125,200
1899	327,580	24,707	13,230			13,564	149,466		364	730	530,141	£170,000
1900	452,568	21,733	6,845			17,924	169,742		200	691	669,703	£191,727
1901	387,311	21,428	16,000	2,732		26,400	213,135	2,989	240	750	669,058	£202,105

APPENDIX F

TASMANIAN OVERSEA EXPORTS - APPLES AND PEARS 1945-60 (bushels)

Year	United Kingdom	Europe	Asia	Middle East	West Indies	Others	Total
1945	Apples 192,490 Pears						192,490
1946	Apples 810,363 Pears	209,306	30,123			114,338	1,169,804
1947	Apples 206,441 Pears	46,208	14,257				258,427
1948	Apples 2,585,541 Pears	73,714	5,977				2,665,232
1949	Apples 351,055 Pears 74,507	91,925	25,470		3,250		1,046,207
1950	Apples 1,799,723 Pears 70,440	465,862	173,783	2,171	3,354		2,515,333
1951	Apples 2,169,326 Pears 204,380	144,445	98,667	3,010	15,675		2,635,473
1952	Apples 2,550,730 Pears 216,255	310,794	115,278		4,700		3,183,073
1953	Apples 2,177,280 Pears 235,259	47,553	23,084		900		2,484,076
1954	Apples 2,569,716 Pears 271,012	640,761	102,329	1,300			3,586,083
1955	Apples 2,365,628 Pears 360,707	712,080	193,083				3,622,554
1956	Apples 2,184,119 Pears 408,815	1,078,205	218,869	5,776			3,915,535
1957	Apples 1,516,926 Pears 192,000	626,302	185,927				2,522,308
1958	Apples 2,609,391 Pears 439,111	1,484,935	188,481	4,550		8,395	4,735,733
1959	Apples 2,735,779 Pears 326,481	562,815	175,733	18,155		47,832	3,867,095
1960	Apples 2,227,457 Pears 326,751	1,082,158	⌘	⌘		⌘	⌘

⌘ No record available.

APPENDIX GTASMANIAN APPLE EXPORTS TO WESTERN EUROPE1946-60. (bushels.)

	Germany	Sweden	Belgium	Holland	Norway	Finland	Eire	France
1946		209,306						
1947		46,208						
1948		73,714						
1949		56,925					35,000	
1950	266,004	79,938					93,708	
1951	63,078	53,059	28,318					
1952	139,099	161,711						9,984
1953		47,553						
1954	307,561	168,503	89,805		35,768		39,129	
1955	308,810	237,806	165,466					
1956	518,346	263,984	190,691	125,184				
1957	318,899	176,731	14,387	14,586	101,699			
1958	402,667	424,772	117,692	323,337	148,052	68,485		
1959	210,340	193,804	26,626	107,205	10,513			
1960	675,282	257,992	43,914	73,495	31,425			

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ACKNOWLEDGEMENTS

The writer gratefully acknowledges the invaluable assistance of the Staffs of the following organisations, the Tasmanian Department of Agriculture, the C.S.I.R.O. Soils Division, the Commonwealth Bureau of Statistics, the Tasmanian Fruit Shipping Agents Committee, the Commonwealth Meteorological Bureau, the Chief Secretary's Archives, the State Forestry Commission and the Commonwealth Employment Service. Also to the many people concerned with the fruit industry who freely supplied information, merchants, processors and above all the growers who showed an appreciative interest in the project and so willingly gave up many hours of their time. Professor P. Scott and Mr. R.J. Solomon of the Department of Geography, University of Tasmania gave much valuable guidance and critical advice. Finally to my wife who spent many long and tedious hours reading and typing the manuscript.
